ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

1992—ISSUE NO. 1 PAGES 1525-1552

PAGE 1526

Cover Picture – Showcase

This fascinating scale is in the collection of Herbert Grieshaber. He sent the photograph with the bare details that the scale is 40 cm (16 inches) high, has a barrel 13 cm (4 inches) long, and a pan 20 cm (8 inches) in diameter. It says 'PERFAD Force 5 Kg. Marque Depose. Brevete. SGDG' on the dial. The dial is graduated up to 950 (grams) but does not show how the user knows the weight between one and five kilograms. The resistant is not stated, but is probably a spring. ***Further details would be most welcome.***

An Early Howe? And How!

By J R KATZ

I was invited to an estate sale some time back which featured much the usual old furniture, nicknacks, glass etc. I was invited because there was to be a fair amount of early ephemera and collectable paper, not necessarily to do with scales. As I am a dealer very much into antique 'paper', covering many topics, the agent thought that it would be worth my while to come out and look around.

I did manage to pick through mounds of debris and find some neat stuff. All too expensive, but I bought it. While on line to pay up, I spotted on a shelf a little postal scale, steelyard variety. With the stocky base and column it most certainly had to be a Howe. I stepped slightly out of line to confirm my suspicions. I read the embossed lettering on the cover plate of the column;– 'HOWE'S BRANDON, VT' Ah, just another dumpy Howe scale as I suspected, moving back into line again. HOLY COW, wait just a fat minute!! BRANDON, VT??? I thought Howe were in *Rutland,* Vermont. I grabbed for the scale pretty damn fast and it was now part of my heap at the check–out table. It was mine.

INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

Founded September, 1976

176 West Adams St. • Suite 1706 • Chicago, IL 60603 • Phone 312/263-7500

For membership information, write to address above.

EQUILIBRIUM is published quarterly in January, April, July and October.

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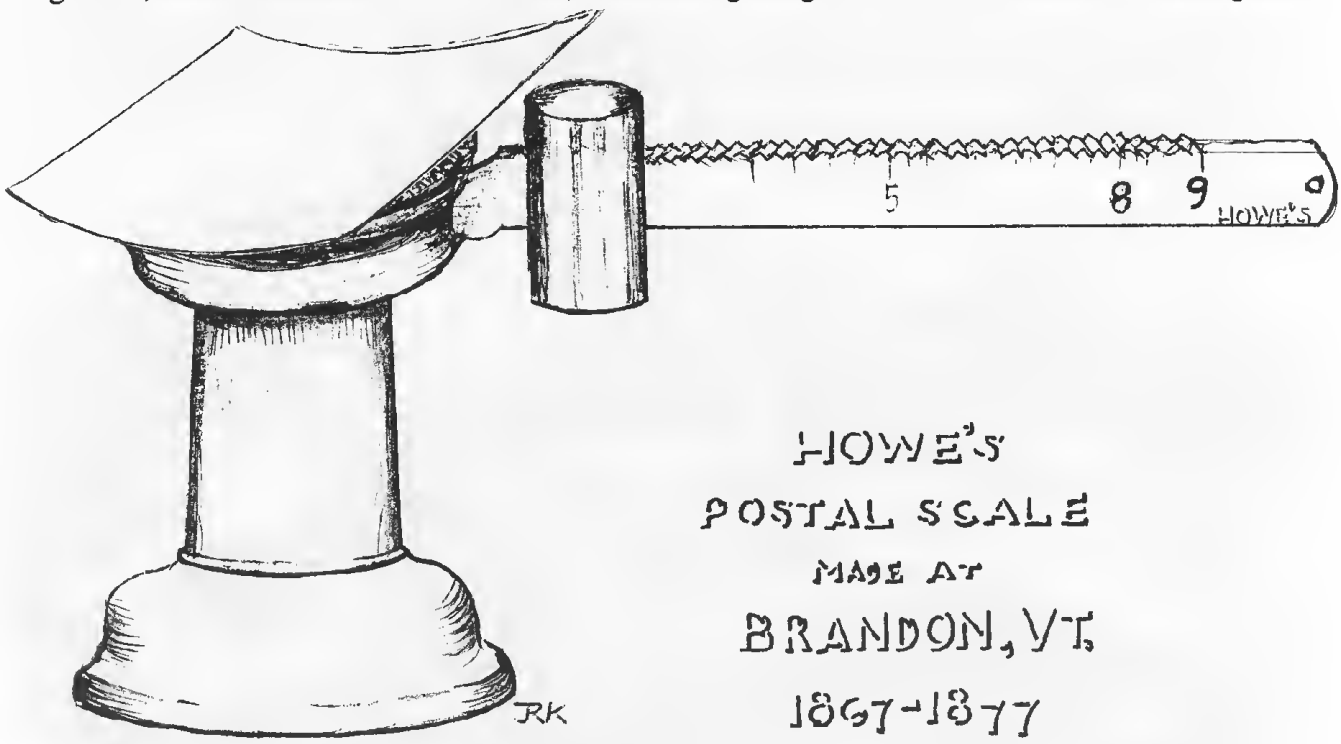
15 Hawthorn Ave, Headington
Oxford OX3 9JQ, England

ISSN-0893-2883

At home, I did the usual cursory check and found nothing about Howe at Brandon, Vt. What next? I knew that contacting historical societies was rather 'iffy', as I will explain, but that, in general, historical societies and libraries, rather than getting on with their business of serving the



public when the challenge is put to them, would rather build road–blocks and hurdles and explain why they can't help, or, if they can, it will be billed at some outrageous cost per hour. Well, I put my request to the Vermont Historical Society in Montpelier, and was I pleasantly surprised! I received my answer in the form of photocopied material that their librarian had selected from their archives. She did it all by herself; no road–blocks, no hurdles, and all she wanted from me was 3 bucks for photocopying charges. Hoorah for Vermont!

Distilled from that information is essentially what follows;–
The Howe Scale Company began manufacturing scales in 1857 in Brandon, Vt. But by 1875 the company began to run out of money and they were encouraged by some businessmen and politicians to move to Rutland, where it could be established near the railroad, to cut transportation costs. In 1877 that move was made. That is Howe's history at Brandon, Vt, in a nutshell.

My Howe postal scale has, stamped into the brass letter plate, the design patent date of June 1867. So, now what did I know about the origin of this scale? It was made when the company was still at its original location of Brandon, so, with a patent date of 1867, the scale had to be made in the period 1867–1877.

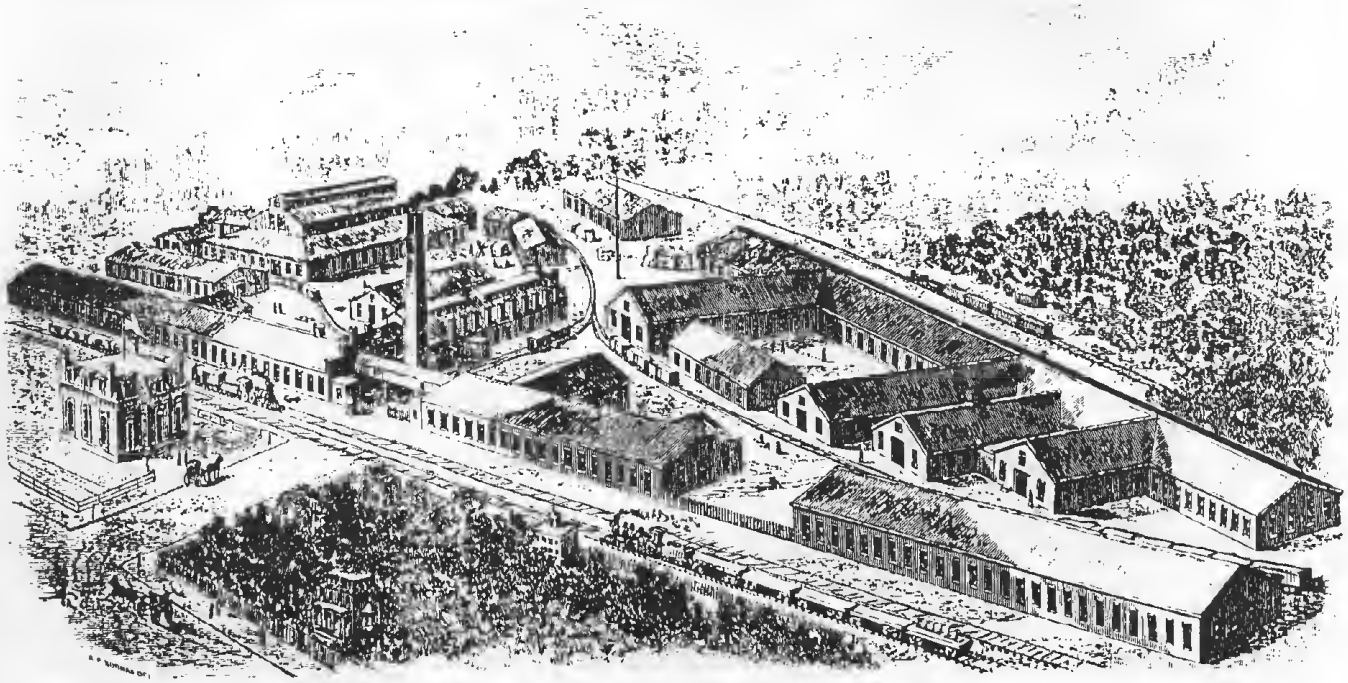
I have seen no other Howe scale with markings from Brandon, Vt. so making the connection between Howe and Brandon, Vt was a bit of a revelation.

Now everyone, run to your Howe scales to see where they were made.....

Howe they Altered

By D F CRAWFORTH HITCHINS

By 1883 Howe's were well established at their large factory in Rutland, Vt. with the main railroad line running alongside three of their large workshops. See Fig. 1. They had the extra facilities of



two branch lines running right into the middle of the factory. The western line forked to the east and the north of the factory, and the eastern line went to the southern buildings, giving transport to almost every building on site. Thus, fuel and raw materials like steel could be brought in easily, and scales of huge capacity could be delivered easily.

Howe's catalogue of 1883 shows that they specialised in large platform scales, including ones to weigh railroad wagons, market goods, animals, warehouse goods, ore and raw materials in factories. They sold a few smaller scales, such as even balances,(robervals) counter steelyards, and wall-mounted steelyards.

Fig. 2.

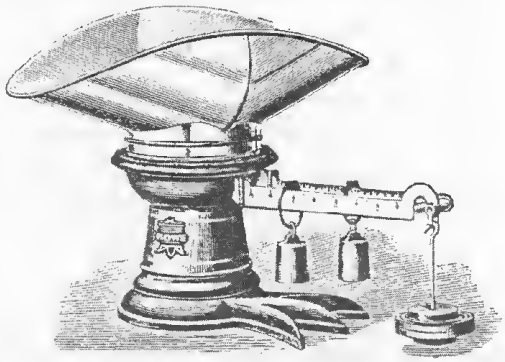


Fig. 3.

By 1883 Howe had their distinctive trade–mark with its inverted crown bottom edge, which was nicely echoed on the base of their Grocers' scale. See Figs. 2 & 10. The triple pointed crown (or claw) was used on their double beam steelyards, giving great stability to the hefty iron base. The double beam went from 1/2 an ounce up to a maximum of 62 lbs capacity by using loose weights for 10 lbs increments. By having two beams , one for ounces and one for pounds, the steelyard was relatively sensitive, while remaining relatively compact and rugged. Scoops made of tin or brass were supplied for bulky goods.

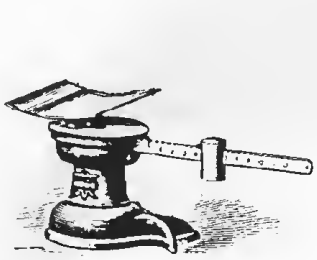


Fig. 4.

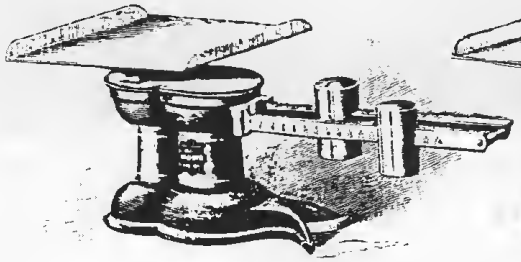


Fig. 5.

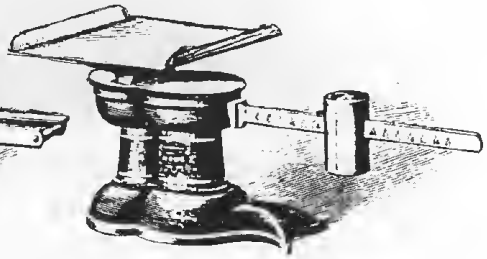
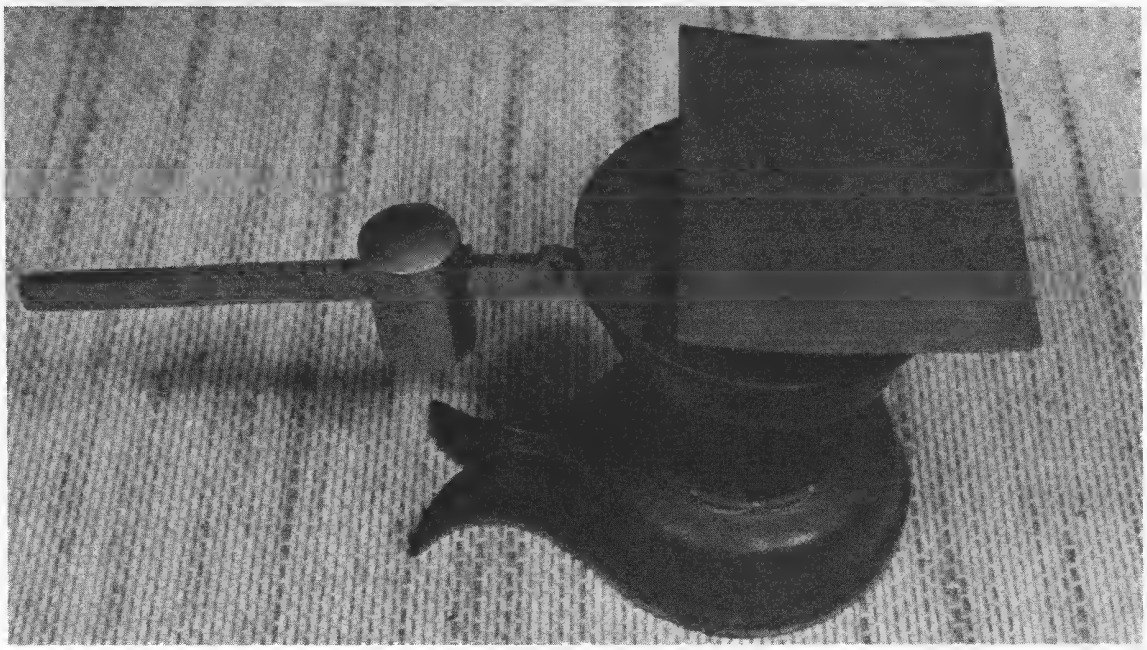


Fig. 6.

Unlike most other scale companies at that date, they supplied only three varieties of postal scale, see Figs. 4, 5 & 6;– the single beam letter balance, (1/2 to 8 oz, 1/2 to 12 oz, or 1/2 to 34 oz.) the double beam letter balance with the double bulge base, (1/2 to 64 oz or the 1/2 to 96 oz.) and the single beam letter balance with the double bulge base, (1 to 64 oz.) These were painted a lovely terra–cotta red with gold ornamentation, see Fig. 11, with either brass beam and letter plate or with the more expensive nickel–plated beam and letter plate.

Fig. 7.



The small letter balance had a mark on the beam showing where the bearings would be put through the beam, were the beam to have a loose–weight hanger suspended from it. See Fig. 8. This demonstrates that Howes were sensible enough to use the same beam for several scales, according to need.

Fig 8.

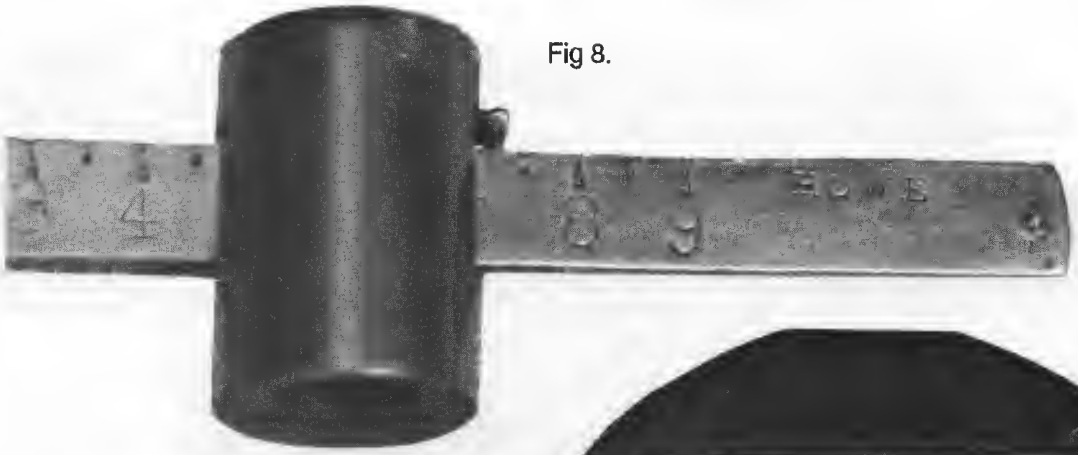


Fig. 9.

Fig. 10.

Howes were also aware of the advantage of the free publicity derived from winning medals at international exhibitions. They entered the 1867 Paris Exposition and won a medal, they entered the Exposition Universelle in Paris in 1878 and again won a medal, they went as far as Sydney, New South Wales, Australia in 1879 and won a 'First Award', they stayed in Australia and won

Fig. 11.

another award in 1880 in Melbourne, they entered the International Exhibition in Philadelphia, Penn. in 1881 and won a medal presented by the United States Centennial Commission and in 1881 they went to the International Cotton Exposition in Atlanta, Georgia and got another medal for their scales.

This note was prepared with the help of Gene Mahoney and Lou uit den Boogaard.

Denison 'Lent'

By A RANGELEY

This account put out by Samuel Denison & Son Limited was indicative of the times immediately prior to the outbreak of the first World War in 1914.

Telegrams:—
"WEIGH, LEEDS."

Telephone No. 1516 Central
(2 Lines).

ESTABLISHED 1820.

Hunslet Foundry,

LEEDS, Feb 28 1914

Eng. S. 1836

Messrs. Rice & Co

Elland Road

To Sam[l.] Denison & Son Limited,

Engineers and Weighing Machinists.

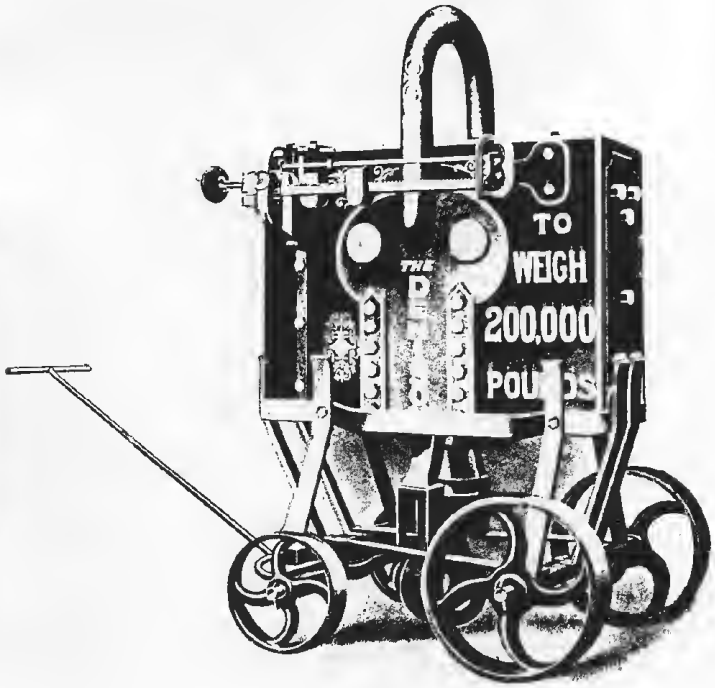
Loan of 30 Ton Suspended Weighers. Feb 12. to 13 Cartage both ways.			10
	7/6		4
agreed by telephone			14

An amount of 10 shillings was agreed for the loan of a 30 ton capacity suspended (crane) weigher for a period of two days, this price being renegotiated by telephone with a consequent reduction of 2/6 or 25%. The journey from Hunslet Foundry to the Works of Rice & Co.(Leeds) at 92, Elland Road, Leeds was a distance of 1 1/2 miles along flat terrain, and one can imagine two apprentices of, say, thirteen years of age, delivering the machine on a handcart. See below. The weight of the weigher would be in the region of 900 lb. with possibly a shackle weighing another 95 lbs. For a cartage charge of 4 shillings the lads would, more than likely, be expected to be back at the Foundry within 90 minutes;- and another 90 minutes would be allowed when the machine was returned, as the cartage charge covered both ways.

The 1909 catalogue gives the distance between the hanging points on the 30 ton weigher as 3 feet 10 inches, the approximate weight of the machine, net, as 8 cwt. 4 lbs, the cubic capacity of the weigher, packed, as 46 1/2 cubic feet, the cost of a packing case, returnable, as £1:8:0, an additional charge of £1:15:0 for a zinc-plated or phosphor-bronze steelyard, the cost of a special shackle as £2:8:0 and the cost of the crane weigher itself as £62. The special handcart cost £6:10.

Supplied from 15 ton to 150 ton capacity

Wrought iron carriages to take 10 to 70 ton weighers



Editor's note;- it is difficult to compare charges then and now. In the 1909 catalogue, a roberval postal scale on an oak stand cost 13 shillings complete with weights. A new scale of that quality today might cost £30 or $45. That gives a ratio of 1 old penny: 20 new pence, putting the cost of renting the weigher at £18 in today's terms, which seems a very small sum for a machine that even then cost £62 to buy and would cost, using the same ratio, £1240 today.

In Fair, All's Love and War

By J KNIGHTS

'Regrets, I've had a few, but then again, too few to mention.'

'Non! Je ne regrete rien.'

These people have clearly never bought anything at an antique fair.

I speak for many collectors, (at least, I hope I do, or I am about to declare myself a complete moron in the eyes of my fellow hoarders,) when I say that the acquisition of potentially desirable items can, all too often, turn into an orgy of self-recrimination and buyer's remorse.

Every time you sally forth into the melee of a new collecting opportunity, you tell yourself that, this time, there will be no mistakes, no regrets. After all, you know your subject, or at least, your own limitations. You can tell a genuine item from a cobbled together pile of miscellaneous components at a hundred paces and you, patently, are totally immune to the blandishments of a dealer who, in all likelihood, cannot tell a bismar from a billiard cue, and who wouldn't recognize an accelerating counter machine if it crawled up his trouser leg and bit him on the left buttock.

Thus, you set out with every intention of appraising every potential purchase with cool detachment, and checking out all the options before making any offer, with as little show of anything approaching enthusiasm as you can possibly manage. So begins another forage for goodies among what can be a bewildering assortment of stalls, piled high with valuables, collectables and things that would require a fair degree of renovation before you would consider throwing them in the dustbin.

At a really big fair, actually looking at the items on offer is largely out of the question. You operate on some kind of automatic pilot and rely on that flash of recognition that occurs at the periphery of vision when some familiar object is passed. Only then do you stop and scrutinize. How then do you, the wise and knowledgeable one, whose caution is legendary, as is your unwillingness to part with money, still manage to end up with disappointment as the reward for your labours? *[Editor; please note that it is you who are disappointed, not the author. The editor was inclined to correct the manuscript to read 'I' all the way through but decided that, as the article was obviously aimed exclusively at her, she would leave 'you'.]*

Motivation is very important at these gatherings, and can drastically affect the outcome of your endeavours. You may set out with specific items in mind. To the uninitiated, this may appear to be a slightly odd thing to do, given that the one thing you cannot guarantee at even the most gargantuan gathering is that any particular piece of merchandise will be present, but experience shows that, in practice, desire, if strong enough, can presage discovery.

The other approach is to be totally non-specific and merely to saunter around in Micawberian expectation that something of interest may hove into view at some time during the proceedings. Both these approaches have their inherent benefits and perils. The 'Holy Grail' method is less

likely to result in casual excursions into unknown areas where mistakes can easily occur. It is, however, when the prize is found that the chevalier can err in judgement. When an object of desire *is* encountered, probably against any reasonable expectation, it is all too easy for rational thought to take a step back and leave mindless enthusiasm making all the decisions. Thus are the broken bits overlooked and the unoriginal additions not detected. Thus does the discerning collector become a blinkered novice and buys fervently rather than wisely. Thus does the 'Ode to Joy' turn all too quickly into the 'March to the Scaffold' as the true situation dawns.

In the alternative scenario of aimless meandering, it is less likely that rationality will be swamped by zeal although, of course, the totally remarkable can still occur. In those circumstances, even the rational buyer can be faced with a difficult choice. If the object in question is indeed so unusual and so unlikely to be repeated, a decision may have to be made to purchase something whose condition would otherwise rule it out of consideration. To purchase such an item may be a good idea, but any satisfaction gained may soon be diminished when a pristine example, on sale for half the price, turns up round the next corner.

The main danger when sauntering, is boredom and an unwillingness to go home without having bought something. In this case, it is all too easy to stray outside areas of total familiarity and buy something which just happens to be there and which sounds some minor chord of recognition. This way lies potential disaster.

On the whole, collecting is a satisfying activity and antique fairs have a certain quality which borders on the addictive for some unfortunates. There are, of course, pitfalls which can blight a particular excursion. Such set-backs are, for the most part, temporary and will in no way seriously deter the true enthusiast. After all, as with all activities that we undertake for pleasure, be it climbing mountains or making models of the Taj Mahal out of empty yoghurt cartons, there has to be an element of risk to make it really interesting.

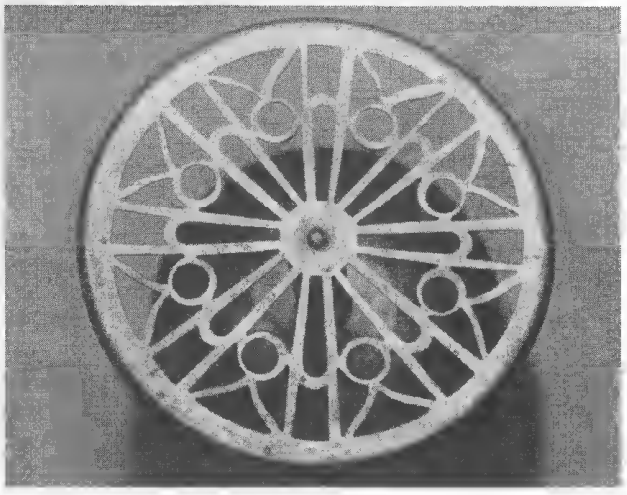
And nobody ever said it was going to be easy.

The editor considers it part of her job to provide suitable illustrations where necessary, but, on this occasion, has decided that discretion is the better part of valour. She does not wish to be reminded too illuminatingly of the fake nesting weights, the scale with the part that is so difficult to make that it has lain in the repair box for twelve years, the beautiful reproduction pendulum that had a base turned out of wood already nicely drilled by the wood-worms, seen in a large and otherwise highly reputable collection, or of the magnificent eyeful of a postal scale with handsome caryatids and Wedgwood plaques still (as far as she knows,) acting as tourist bait on Portobello Road for the unwary adventurer who can't recognize a marriage. Maybe she could use the catalogue of Libra, that enterprising Portuguese company that makes reproductions that are good enough to use in the home as real scales, and are certainly decorative enough to get centre place on many a mantelpiece, with their bulls heads holding the shears, or their curvey blocks holding the weights at the base of the pillar so that the only give-away may be the plaster of paris inside the block.

French Patent Postals Part 3

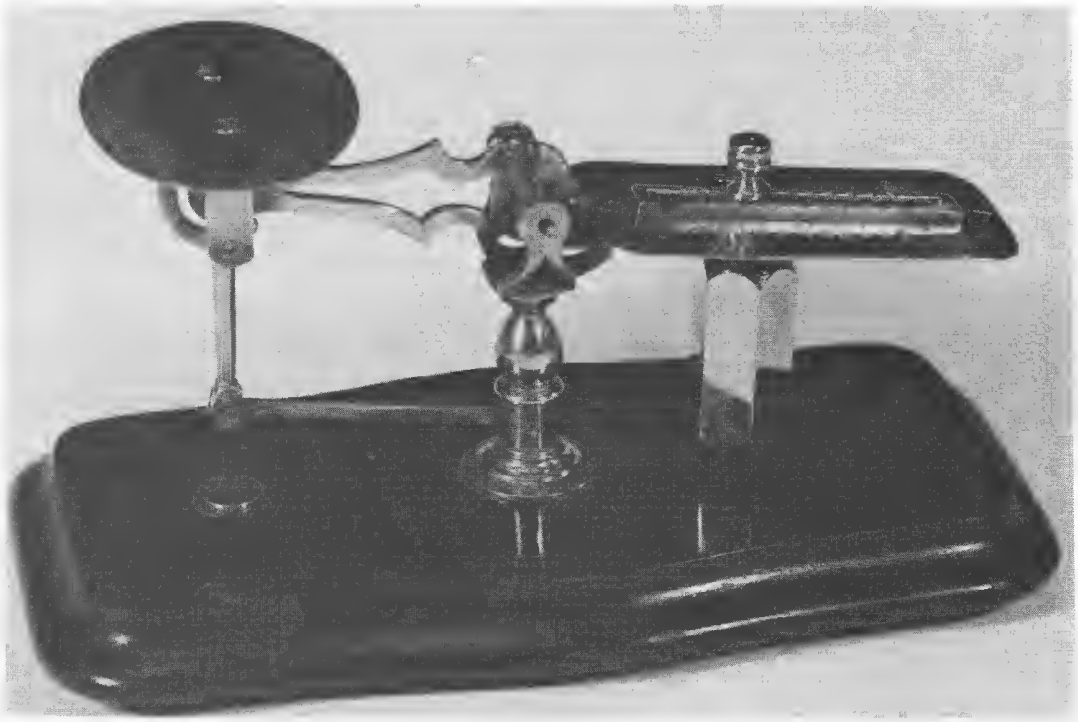
By W DONIGER & L UIT DEN BOOGARD

French patent number 28419, granted in 1856 to Narcisse Eugene Briais, mecanicien, rue de Calais, Belleville, Seine, for a letter balance. See the original patent drawings on page 1375 of EQM. The drawings show that the resistant was a spring inside the wooden case , attached to the bottom of the rod under the letter plate, but, unlike the conventional English candlestick , the spring was an expanding spiral, getting bigger towards the base .

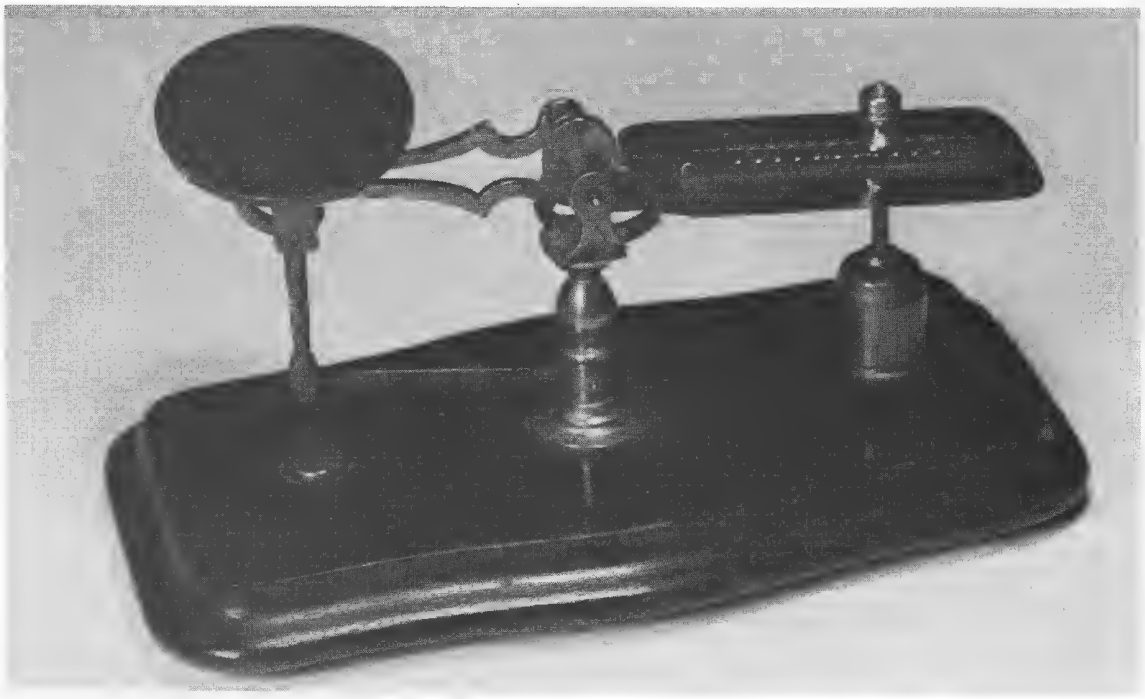


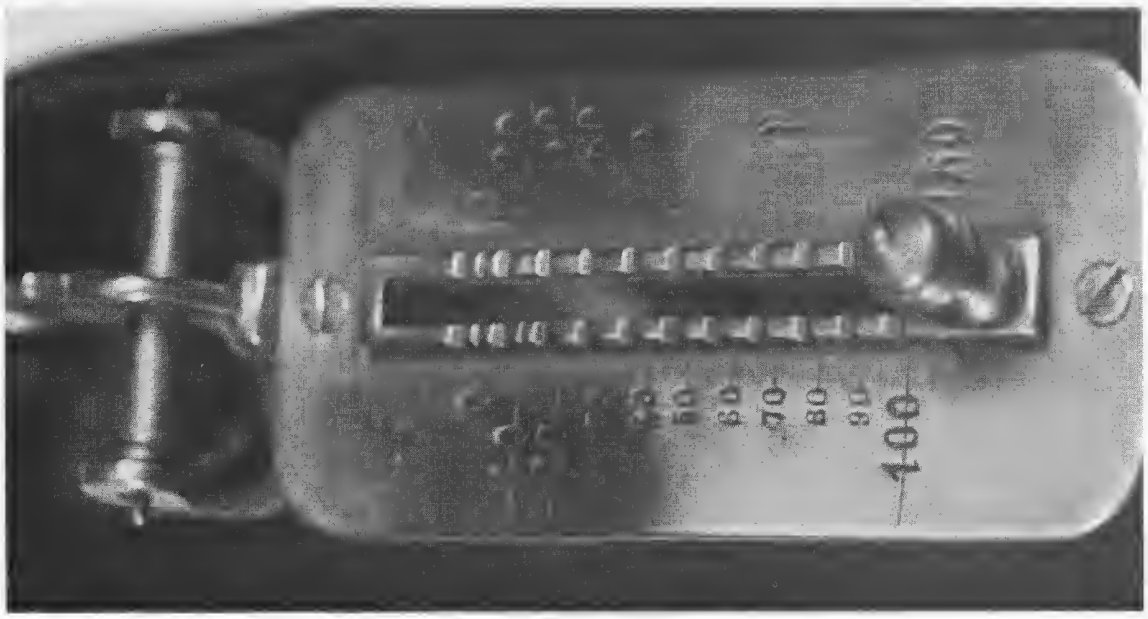
The design of the letter plate was a modified version of the grill under the base. The outer ring of the design was omitted, leaving a very satisfying pattern of circles and petal shapes.

The original patent was clearly designed for a wooden case, and the photograph shows how attractive it looks with its ebony case, and how nice it is to handle.



French patent number 64178, granted in 1864 to Victor Briais. See the original patent drawings on pages 1403 and1404 of EQM. The photographs show that the scale was made by Narcisse Briais, presumably a relation of Victor Briais. The design was modified in production. The pointer was omitted, and the correct weight was indicated when the letter plate's rod was lifted clear of the brass stop on the wooden base.





The round weight of the design was changed to a handsome hexagon which rested on the wooden base if it was moved too far along the steelyard beam. This had the advantage of showing the correct position for the weight and preventing too great a strain being put on the half–roberval linkage if the weight was too near the end of the beam.

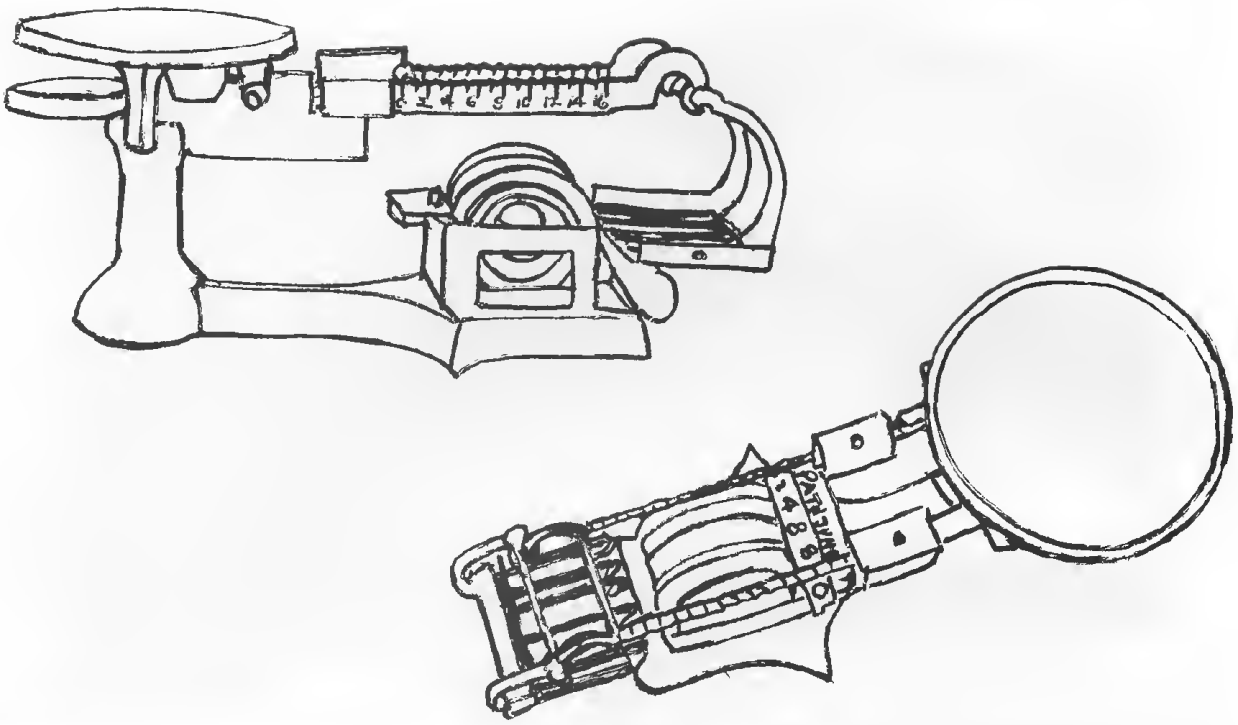
The letter rates seen on the graduation plate show those for the period 1862 to 1870, (up to 10 grams for 20 cents, 10 to 20 grams for 40 cents and 20 to 100 grams for 1 franc 60 cents,) but, as the scale was only designed in 1864, the scale must have been made between 1864 and 1870.

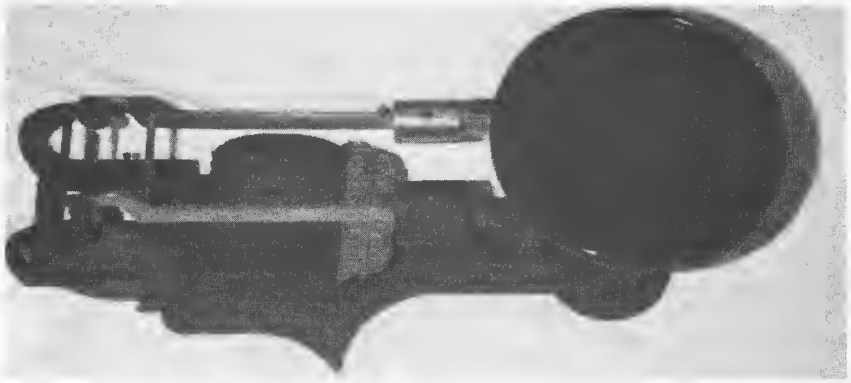
Notes & Queries

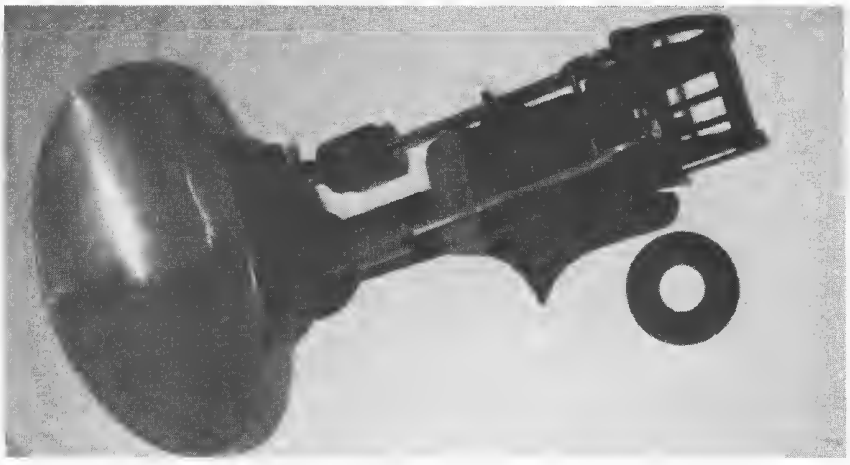
Query No. 114 from E Comstock

I have a double beam steelyard for grocers' use, with an unusual hanger for extra proportional weights. The extra weights are discs stored below the double beam, from where they can be rolled across the gap and into slots in the hanger directly opposite their storage slots. This enables the hanger to hold all the discs vertically so that their total can easily be ascertained. A brass plate beside the storage slots is embossed 'Pat'd June 19, '83. 1/2, 4, 8, 8, 10.' This gives the proportional weight of each ring, (that is, 1/2 lb, 4 lbs, 8 lbs, 8 lbs, and 10 lbs,) which can be used in conjunction with the beams. The front beam goes up to one pound in ounces, and the rear beam goes up to two pounds in ounces and quarter pounds, so when they are used together, without the rings, the capacity is 3 lbs.

Can any ISASC member tell us who manufactured this scale? Has any member got a copy of the Patent?





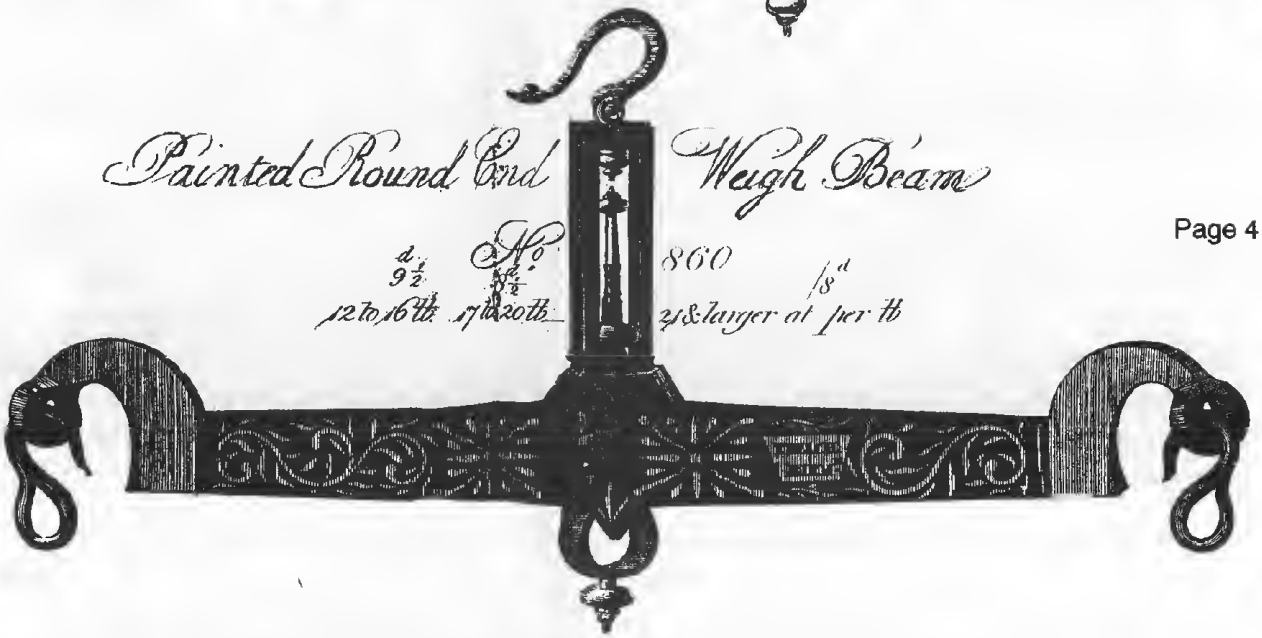


Thomas Beach Part 2

By D F CRAWFORTH–HITCHINS

Page 3.

Page 4



The Painted Round End Weigh Beams on page 4 of Avery's catalogue were conventional trade scales of the period, painted black and ornamented with red scrolls. The upper beam was available in two inch increments from 20" to 36", and was sold at 3 inches per shilling for the smallest size and 2 inches per shilling for the largest. This reflects the fact that the cost of the iron was by far the greatest component of the price, and that labour costs were relatively insignificant. This explains why the special orders for even larger beams cost 1/4 per pound.

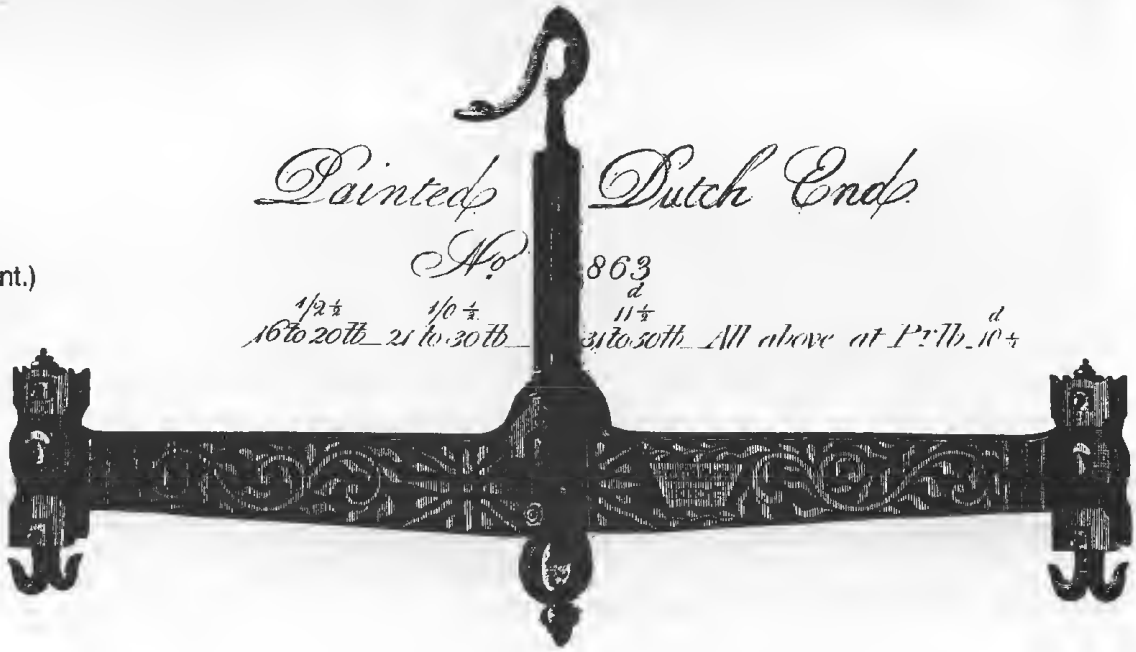
The lower beam was a cheaper product with a simpler hook on the end, and cost only 8d a pound. It could be used to weigh 4 cwt.

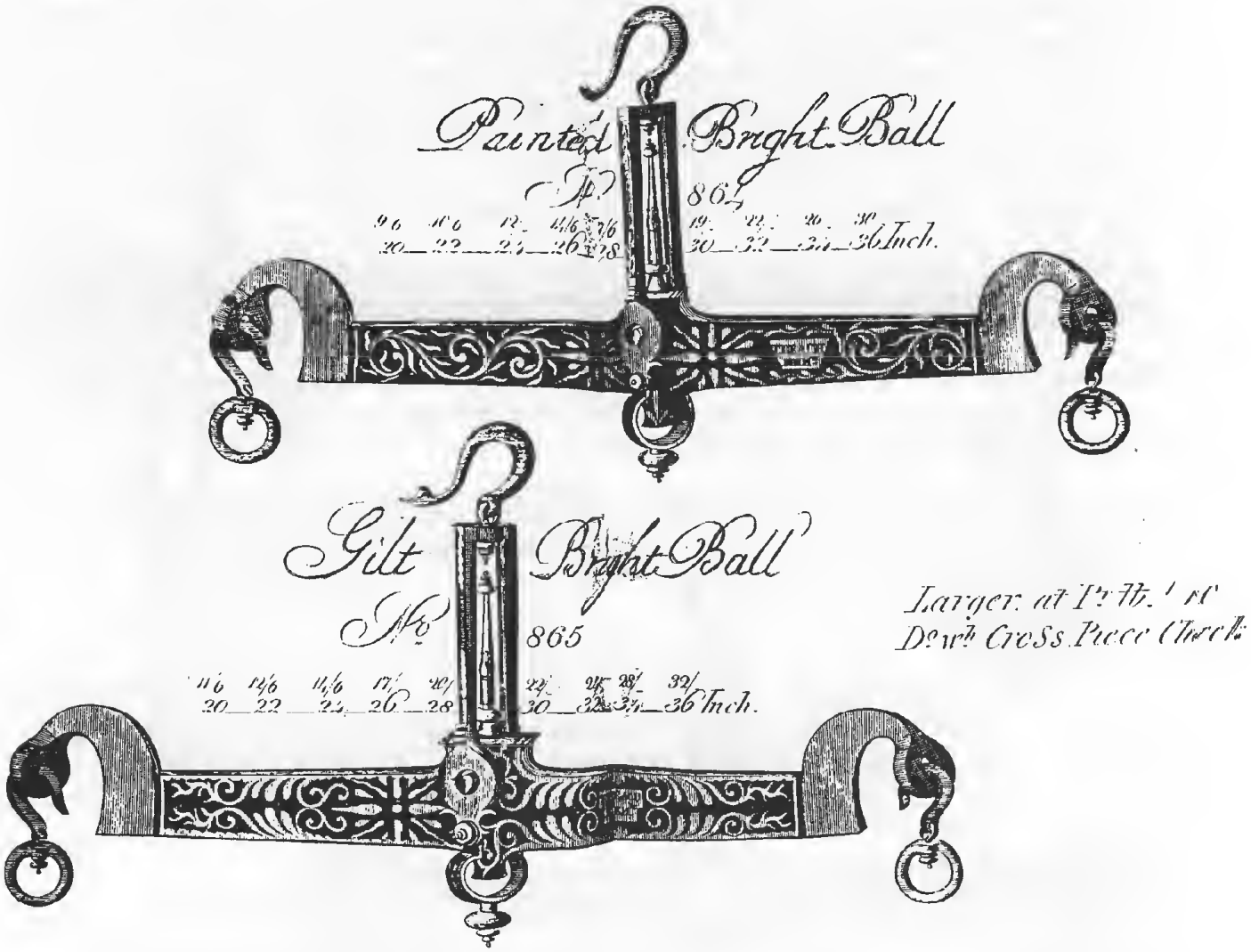
Round End was what we call a Swan–neck End.

The Painted Square End Weigh Beam on page 5 was a rugged beam, used with ropes supporting huge wooden pallets – a common, cheap platform, easily made and easily replaced.

The Painted Dutch Ends was a massive beam with strong but sensitive ends for accurate weighing of large quantities. The use of a reference code number of 863 does not mean that he made 863 varieties.

The Painted Bright Ball on page 7 was another trade scale which looks incredibly similar to the first scales shown, but were nearly twice the price. It is impossible to explain this anomaly now, but one must assume a much greater degree of skill in making the pivot points, and greater durability.





The Gilt Bright Ball was probably the same scale as the one above, but with real powdered gold used to decorate it. The prices don't quite match, but no differences are visible.

Thomas Beach put all his craftsmanship into his Box End Scales, on page 8, and made them commensurately more expensive than any others he made. The hooks were finished with animals' heads, the central pivot point was cut and curled round the edges, each box end had two finials screwed into it, and the pendant was the fancy inverted curl type. The cheapest 20" beam was 38/–. Presumably they sold, or he would not have illustrated them in his expensive catalogue.

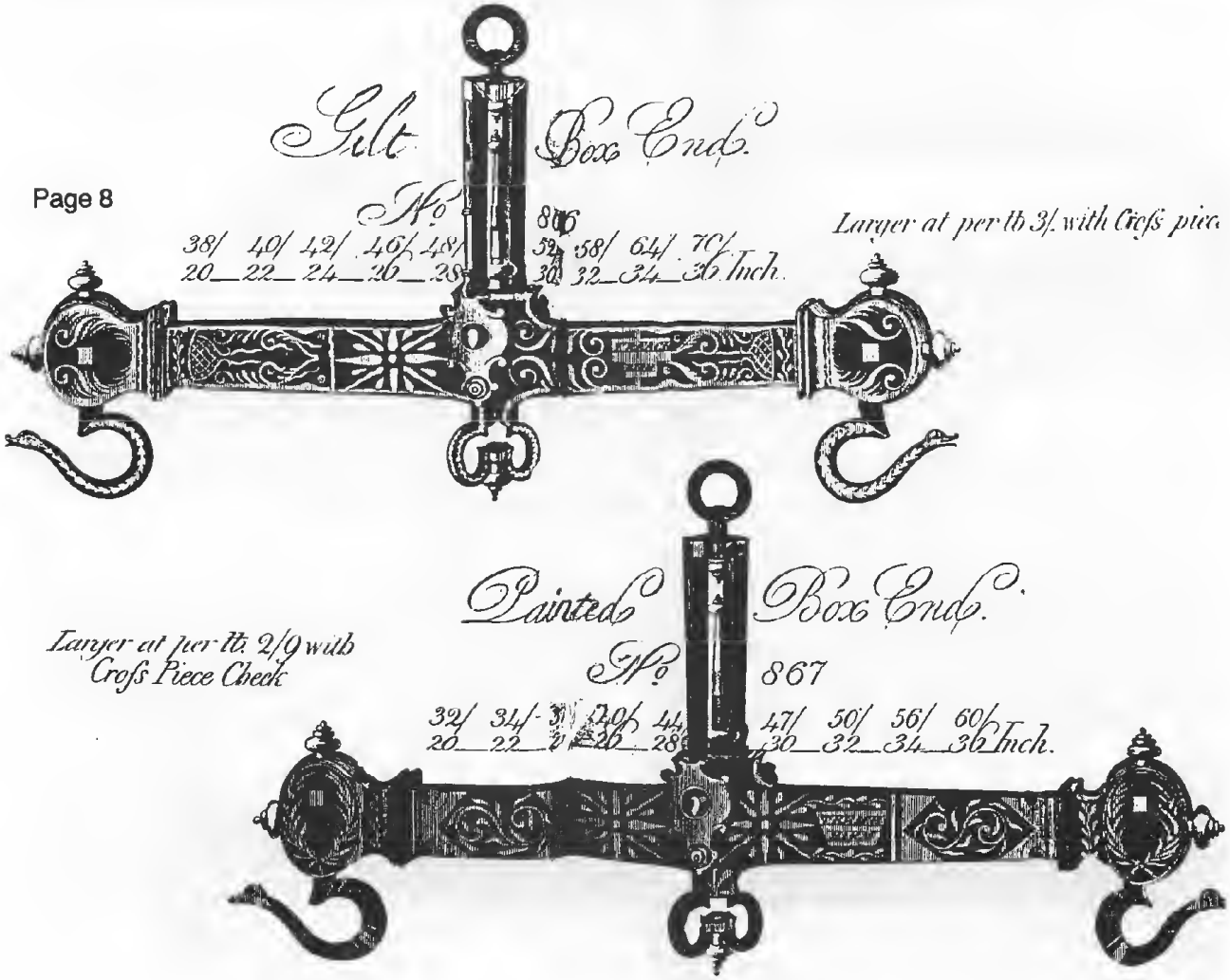
Thomas Beach was a master steelyard maker, and no doubt prided himself on the range he offered. The smaller sizes were available in 10 lb increments, the larger ones in 50 lb increments and the largest in cwt increments. The ones "to begin at 1 lb" (possibly balancing at zero?) were more expensive, although it is difficult to explain why, as they would have cost no more to make.

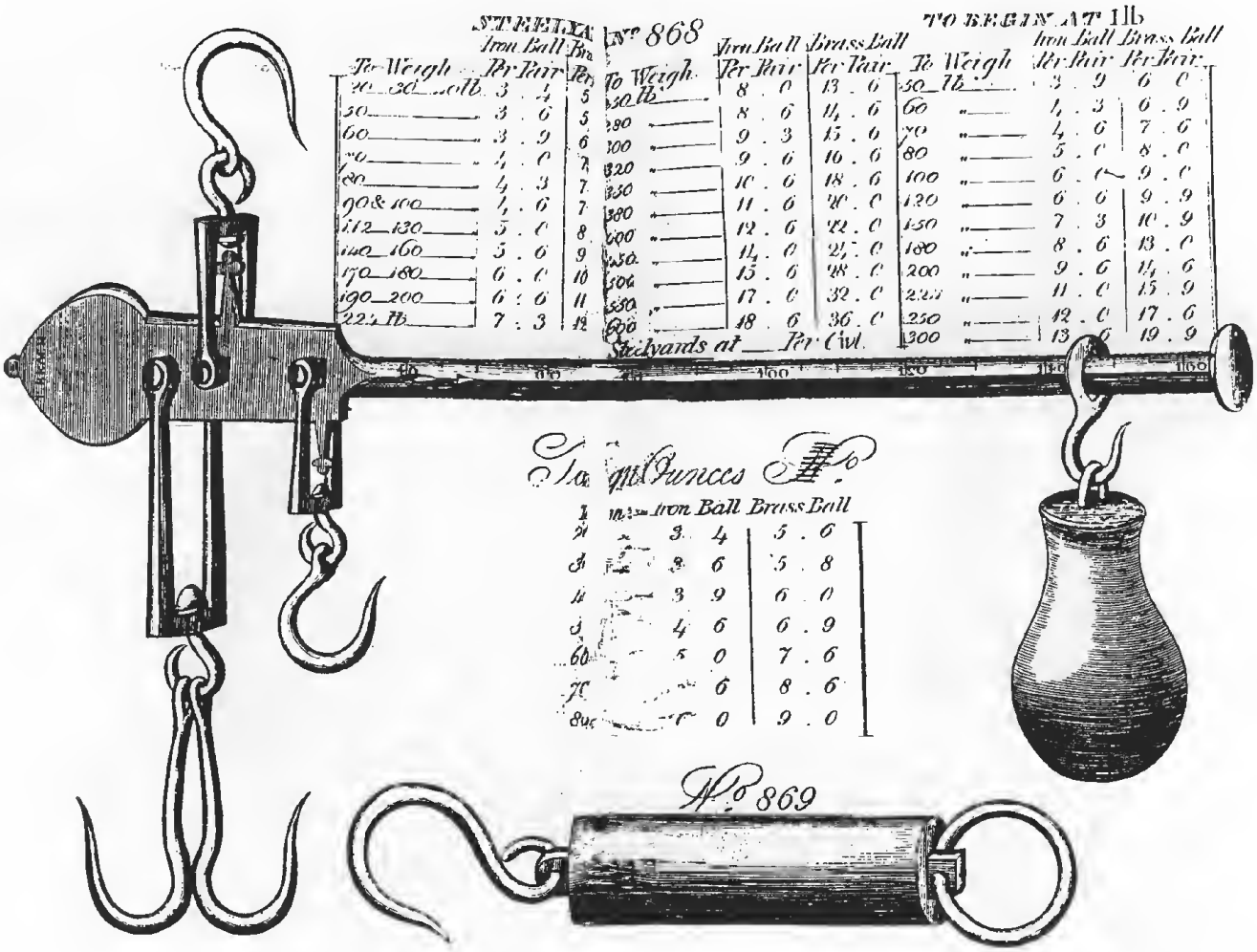
The version with the iron balance ball was only two thirds of the price of the one with the brass balance ball, reflecting the very high price of brass. Brass was £84 a ton in 1780, and the bosses of the largest Birmingham firms got more and more irate with the only brass maker and his monopoly. They got together and started their own brass company, opening new copper mines in Cornwall and encouraging the improvement of zinc production (rather than using the cruder and less predictable calamine.) The firm who had held the monopoly brought down the price to £54 a ton – which says something about their previous profits! – but demand was still higher than the British brass trade could supply, and imports of brass continued.

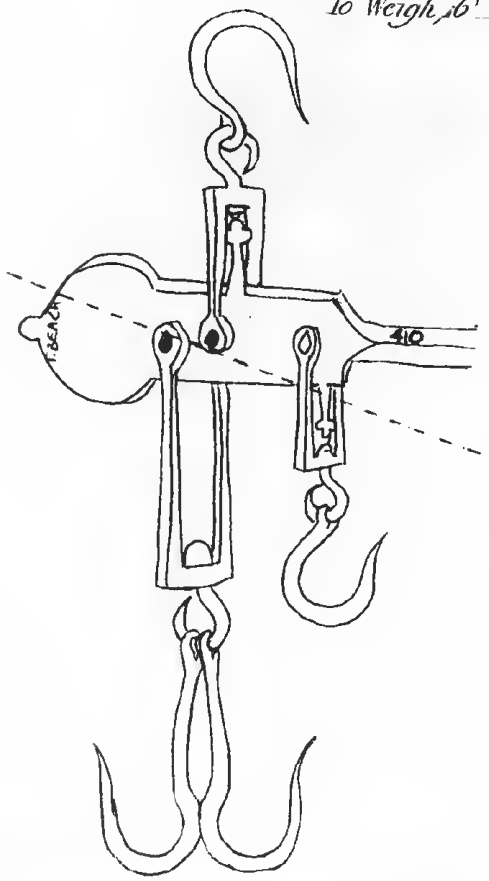
As Thomas Beach was not a great user of brass we must assume that he was compelled to pay £54 a ton for his brass.

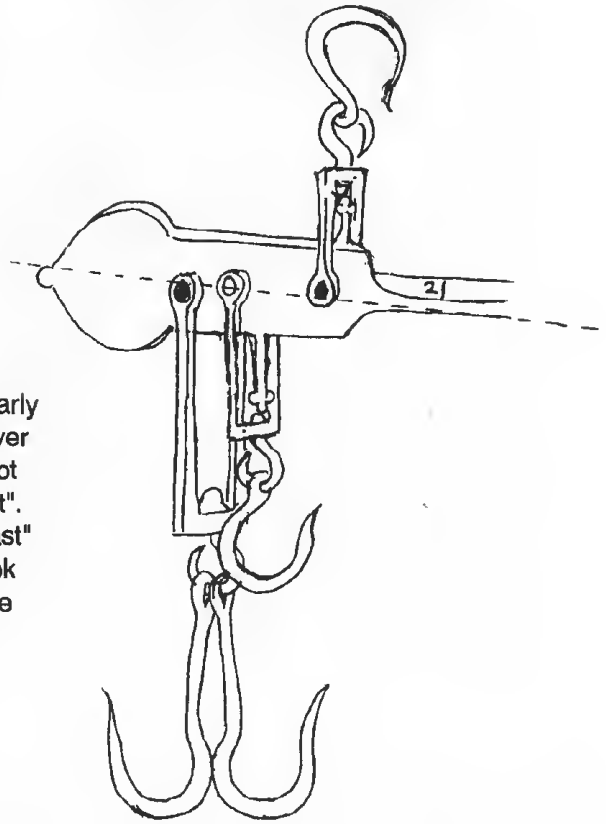
His confidence in his product was reflected in his juxtaposing the spring balance with his steelyards. 12 spring balances to weigh 20 lb cost 7/–, 12 steelyards to weight 20 lb cost 66/8. No wonder William Salter had a successful business.

Beach's steelyard on page 10 looks entirely conventional – a typical turn–over steelyard, yet it is headed "This Steelyard acts upon the same principle as the Patent and differs only in the

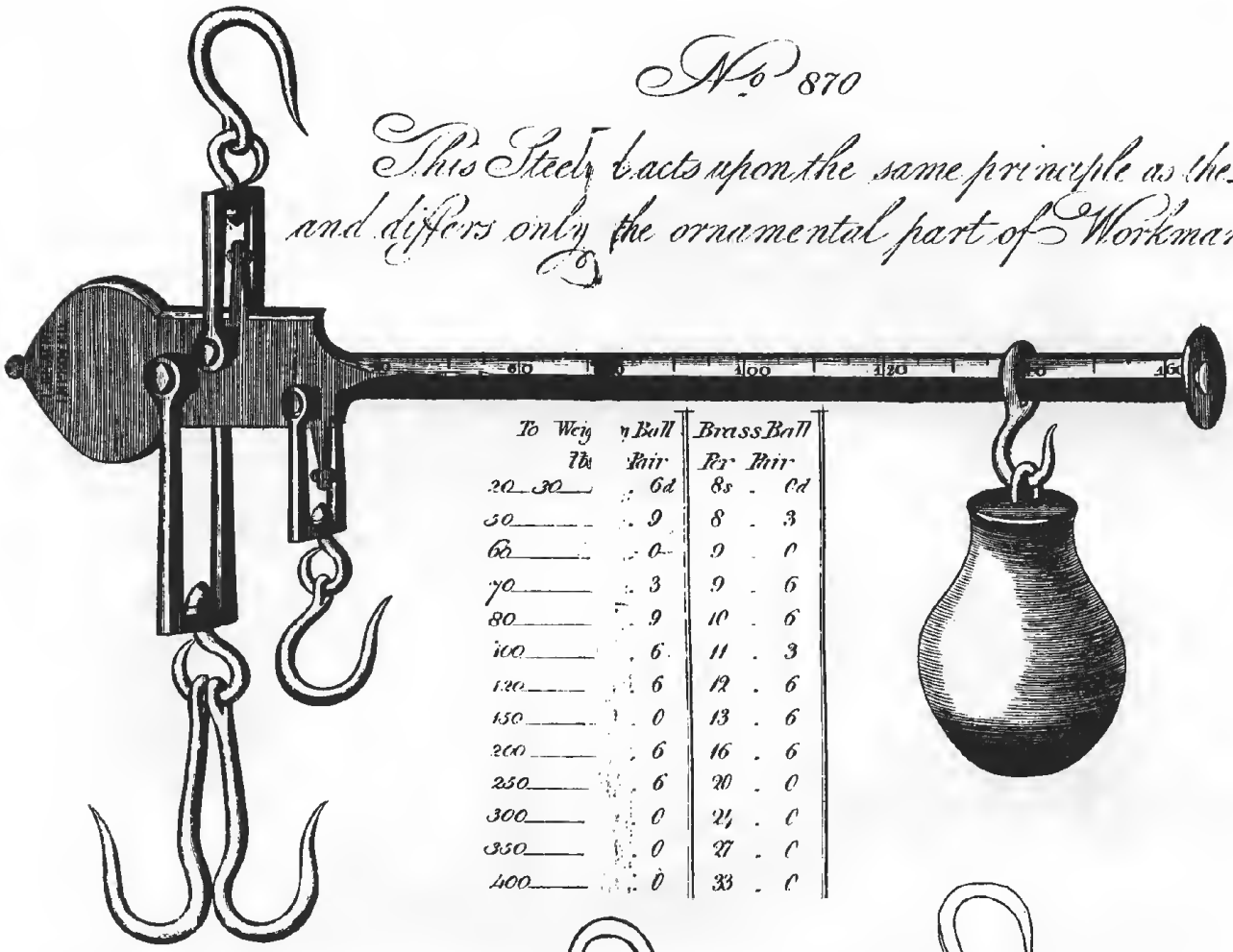








Page 9 shows the early version of a turn-over steelyard, with pivot points that are "fast". It was especially "fast" with the larger hook used as the handle (on the left).

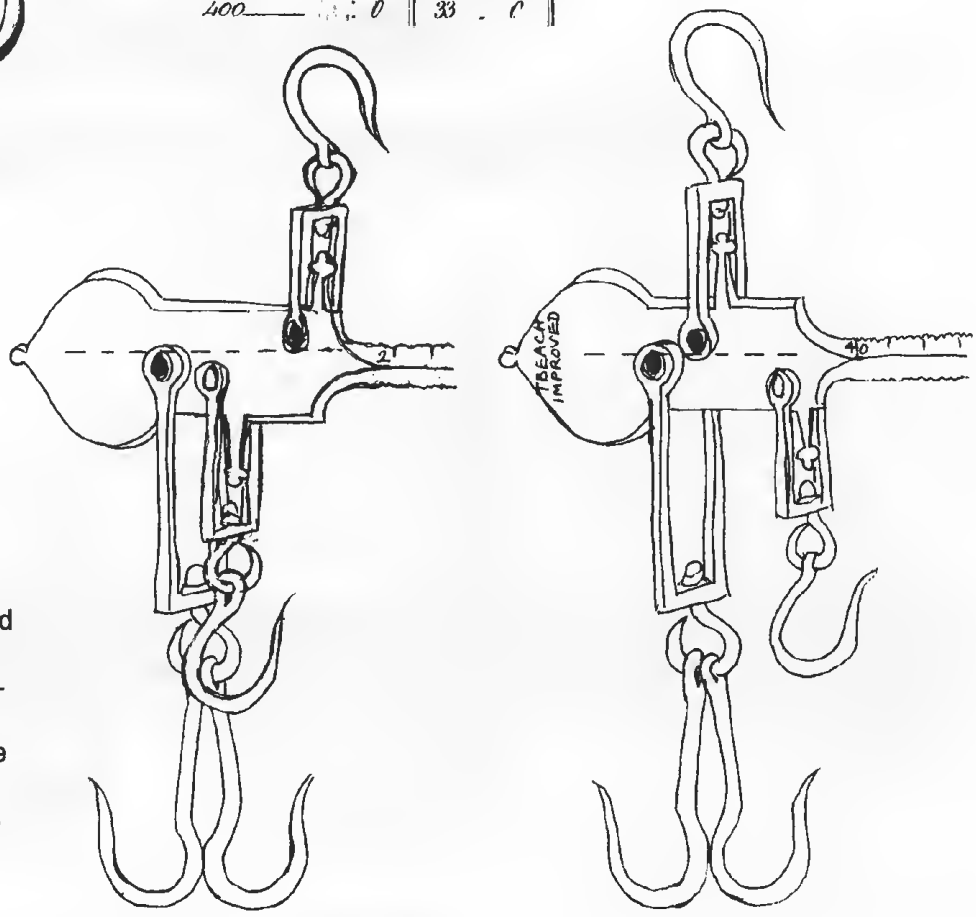


No 870

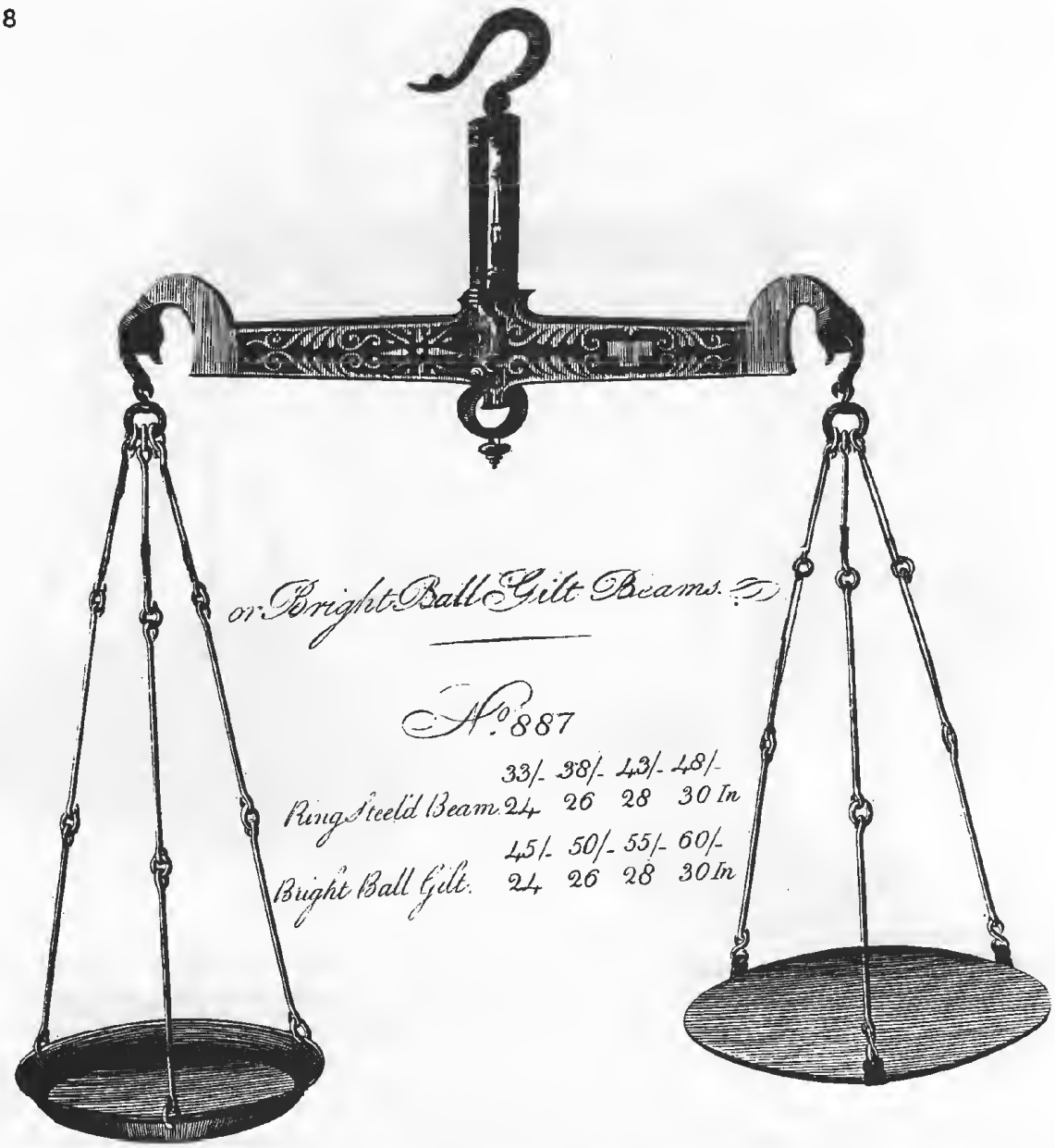
This Steely acts upon the same principle as the Patent and differs only the ornamental part of Workmanship

To Weig lb	n Ball Pair	Brass Ball Pr Pair
20 30	6d	8s . 0d
50	9	8 . 3
60	0	9 . 0
70	3	9 . 6
80	9	10 . 6
100	6	11 . 3
120	6	12 . 6
150	0	13 . 6
200	6	16 . 6
250	6	20 . 0
300	0	24 . 0
350	0	27 . 0
400	0	33 . 0

Page 10



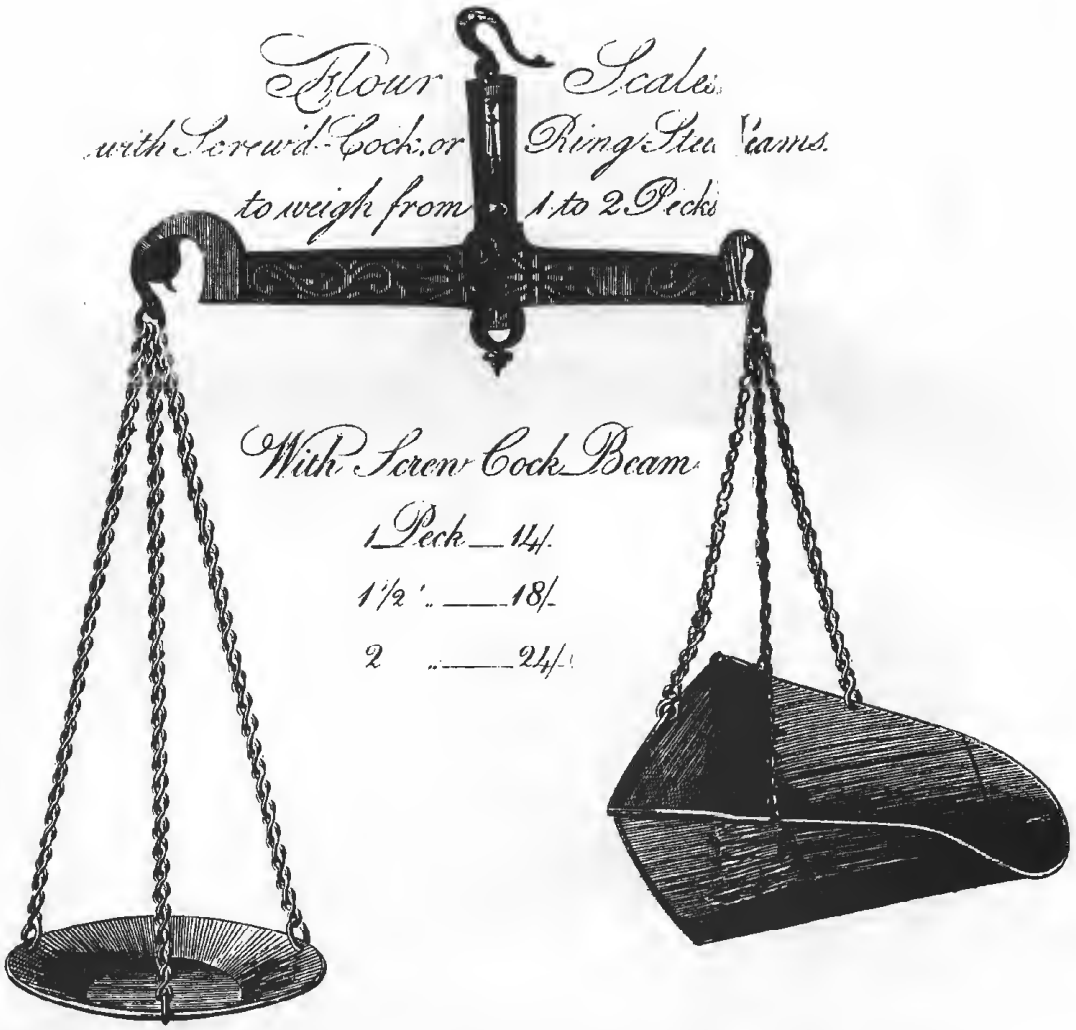
T. Beach stamped "Improved" on the end of this steelyard. The pivot points are carefully placed so that, whichever way up the steelyard was being used, the pivot points were in line.



ornamental part of workmanship". No patent exists for a steelyard of this type, so we are at a loss to explain the comment. The pivot points are modern in concept – the double hooks and the "handle" (the bigger hook) had one centre of gravity when in use. When the beam was turned over, the smaller hook formed the handle and the double hook swung round, putting their pivot points in line, on the other end of the double hook's knife edge.

If you look back to the previous steelyard you will notice that the pivot points were not properly in line when in use, so this may be the Improvement stamped beside T Beach on the counterweight.

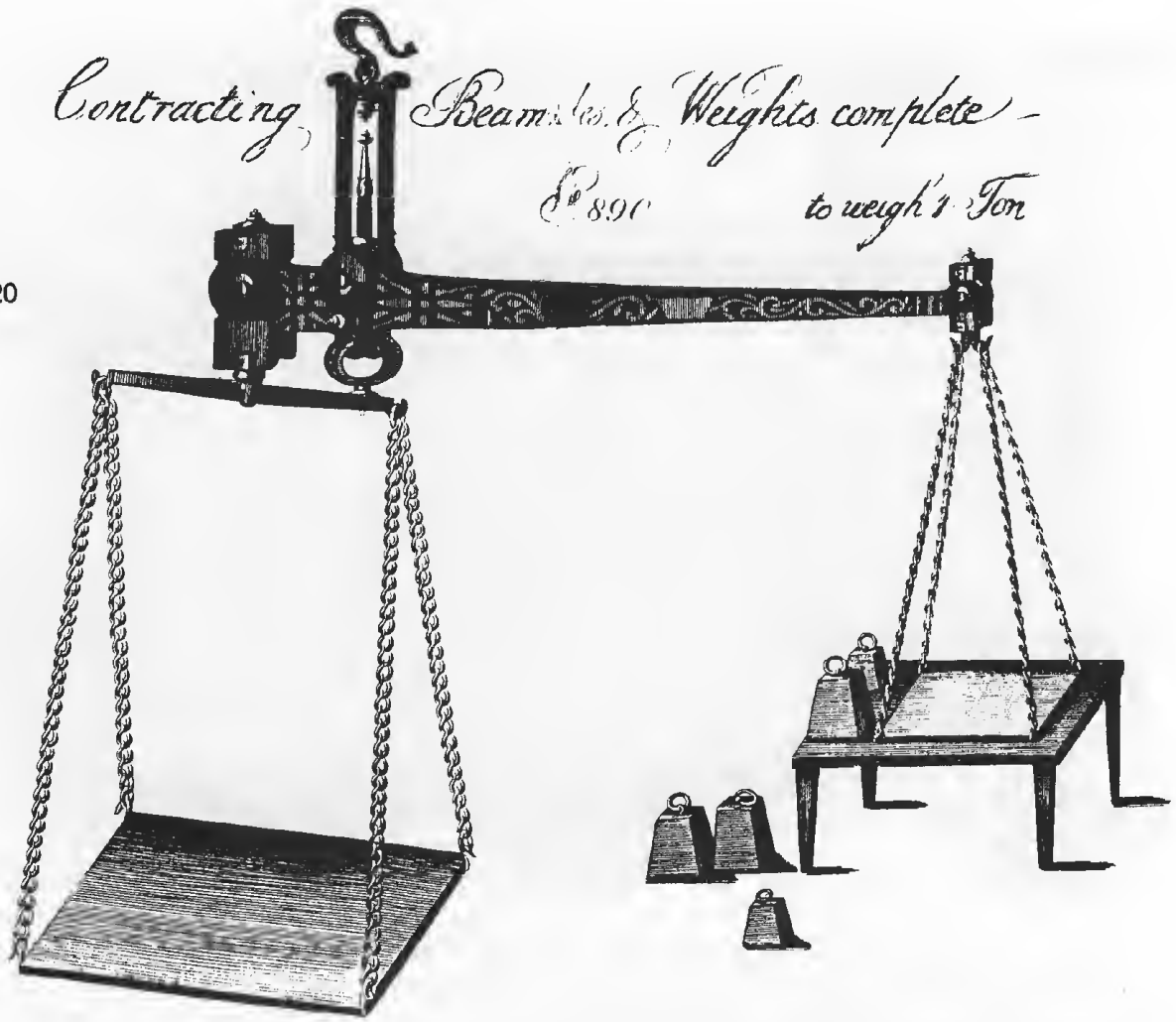
The Cheesemongers Counter Scales on page 18 was a very large beam for a cheesemonger, going up to 30 inches in length and a 15 inch diameter flat platter. What was the platter made of? It illustrated linked rods – possibly the first time they were shown.



The "Flour Scales with Screw'd Cock or Ring Steel'd Beams to weigh from 1 to 2 pecks" on page 19 was a strange concept. If a grocer, miller or baker measured out a peck, that was a defined quantity – two gallons – (about what a modern household bucket contains) – so why weigh it? Everybody knew how much a peck was, as it was a commonly used measure. Perhaps it was called a peck scoop just to give some idea of its capacity. The 2 peck scoop was a large and cumbersome object (I speak feelingly, after attempts to photograph our Thomas Beach flour scales) and needed a heavy pan on the other end to counterbalance it. The knife edges were not hardened or made separately – the hole in the swan neck was merely filed to a sharp edge.

Why did Thomas Beach mention the Screw'd Cock? All round pointers were screwed in at that time on large scalebeams – as were the finials, pendants and swivelling hooks. (Our Samuel Read trade beam, made in 1774, dismantles into 25 pieces.)

The Contracting Beam Scales & Weights Complete was a massive piece of blacksmithing. A huge Dutch End took the weight of the load, and a smaller one took the weight of the proportional weights. As the distance between the pivot points was 1 – 7, the weights were 2 lb to weigh 1 stone, 16 lbs to weigh 1 cwt and 32 lbs to weigh 1 ton. The weights were easy to move on and off the weight pan, as they were used at hip height, and the load was easy to manoeuvre as it was at ground level.

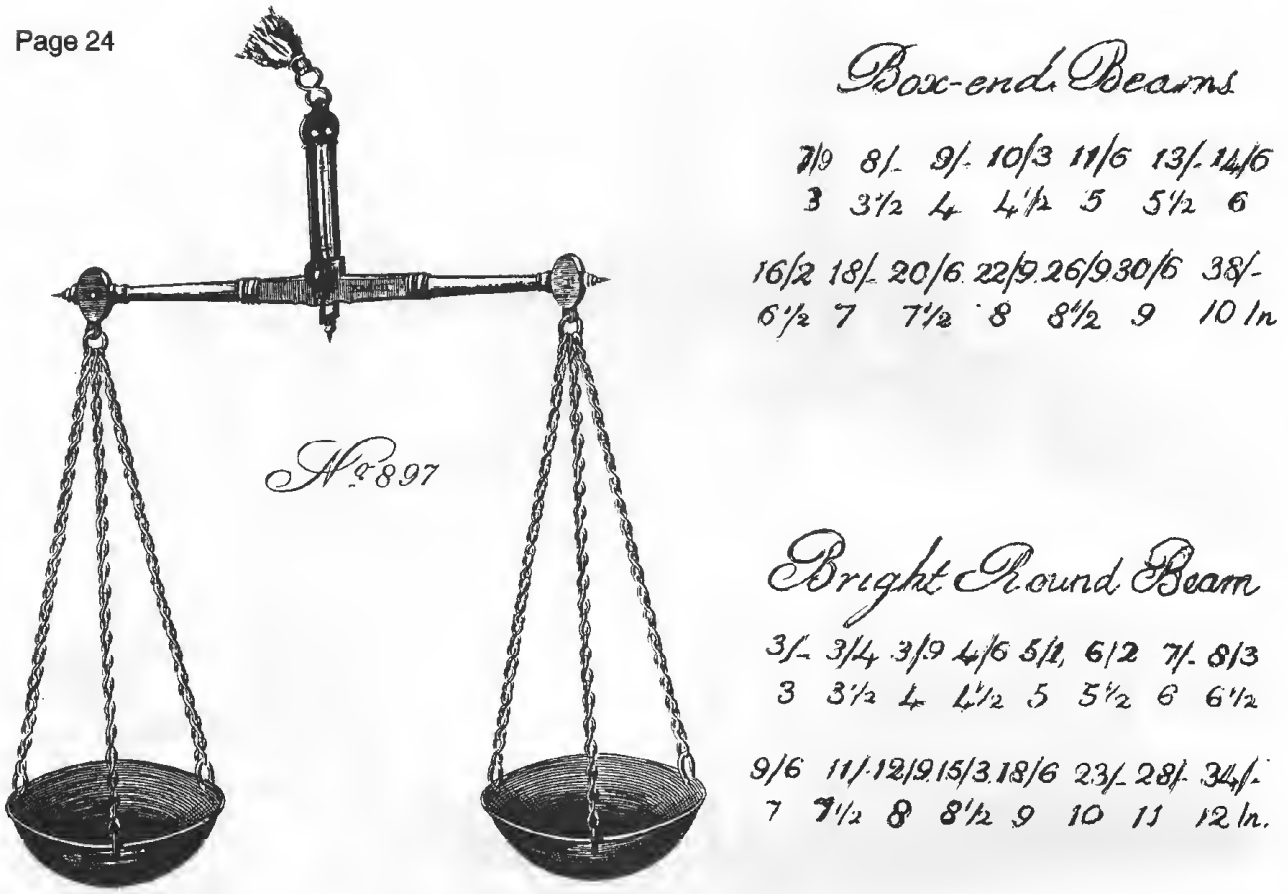


It is difficult to classify such a beam. It was not a steelyard, a bismar or a moving load scale, as none of the pivot points moved, so it must be called "an unequal arm beam with proportional weights". Very few other examples of this principle exist.

The Deep Copper Scales with Bright Round or Box End Beams on page 24 were little scales for fine weighing. The difference in cost (nearly 3 times, more for small sizes) between the swan–neck end beam and the box end beam, in this instance reflected the greater amount of labour used to make the round and square section Box End beams, with the fine collars and oval boxes, well shaped top to the shears and finials on the ends. The smallest sizes – only 3 inches long – were scarcely practical but the larger sizes had many uses, and were supplied in an amazing range of sizes, (3 inches to 12 inches in half inch intervals, so 16 sizes were available).

So we have a picture of a scalemaker supplying scales in a huge range of sizes, weighing items from a few drams to over a ton, painted scales and white (polished) scales, equal arm, unequal arm, steelyards and spring balances. Presumable Thomas Beach did not carry all the sizes offered (197, without variations or special sizes) in stock,but made many to order.

It is interesting that although he was making scales until 1797, there is no evidence that Beach offered Roberval scales, reinforcing the presumption that George Medhurst invented them between 1800 and 1824.



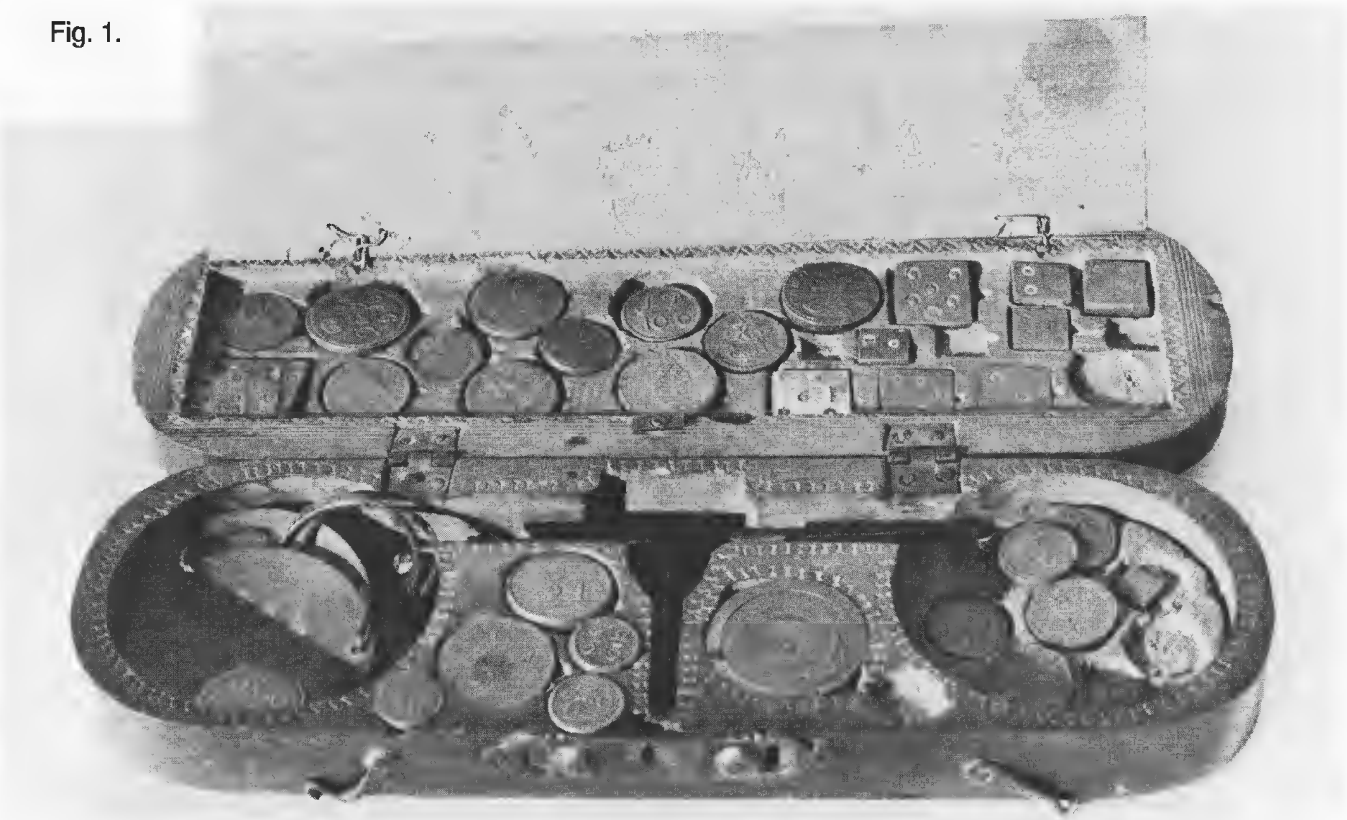
Editors note. Please note that nearly all the drawings went across the fold of the binding, and so the pictures are distorted and some printing out of sight. Part 3 in the next issue.

Unusual 1640s Coin Scale

By N BIGGS & D VANGROENWEGHE

An unusual English coin scale has recently come to light. It is particularly interesting because of its age, its size and the numerous weights which it contains. Boxes with large accumulations of weights turn up from time to time, a famous example being the Marquess of Worcester's box, first described by Sir Herbert Read in the *Proceedings of the Society of Antiquaries* for 1916, and featured in Sheppard and Musham's book, *Money Scales and Weights.* [See EQM page 1377.] When we discuss such items it is advisable to remember that a box may contain an accumulation of weights for more than one reason. The valid reason is that the box was used by several generations of people, who added new weights relevant to the coins in circulation at the successive periods of use. But it is not unusual to find that numbers of weights have been added to a box in more recent times, simply to increase its saleability and value. Not much is known about the history of this box, beyond a small slip of paper indicating that it was bought from Spink, the London coin dealers, in 1961. For various reasons, outlined below, it does appear that the accumulation of weights is genuine in this case.

Fig. 1.



The box is in some respects a typical English production from around 1640. Examples of this type have been described by Sheppard and Musham (pages 34–35, where the date is given wrongly) and by Diana Crawforth (EQM, pages 1352–1358), among others. However this box is significantly larger than the 'normal' examples. Its dimensions are 9 inches (22 cm) x 2.75 inches (6.8 cm) x 1.5 inches (3.5 cm), in contrast to the 'normal' length of about 7 inches (17 cm). [One other example of a 9 inch (22 cm) beam is known, in a pristine box in the Science Museum in London, with six square pennyweights in the lid, in addition to the conventional round coin weights. See Fig. 3. Ed.] Of course, no two of these boxes are identical, and it is likely that some were specially made to the requirements of the individual customer.

If we ignore for the moment what are clearly later modifications of the fabric of the box, it will be seen that this example was designed so that its lid could accommodate eleven round weights, some grain weights (in the square cavity on the extreme left), and some larger square weights. In

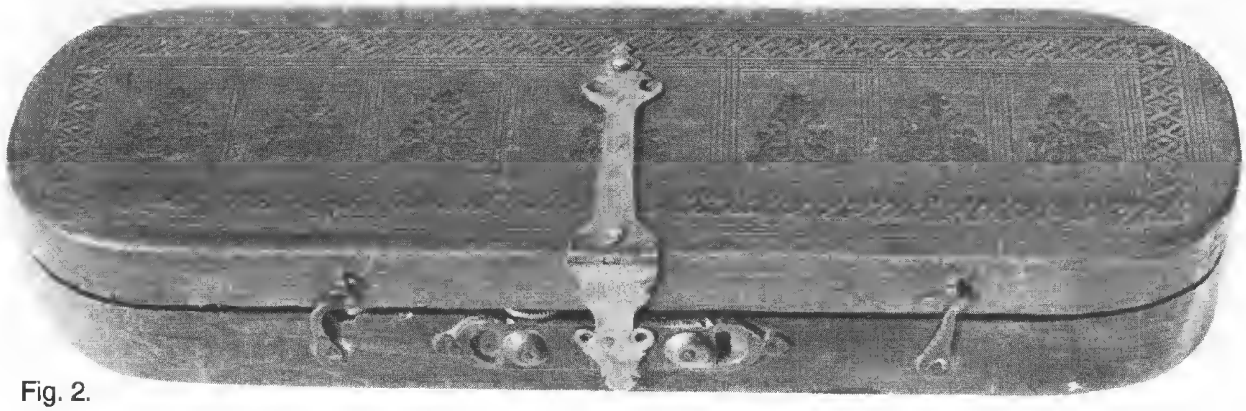


Fig. 2.

the base there are spaces for five round weights on the left hand side, and a nest of weights and one round weight on the right hand side. The normal examples have spaces for ten round weights and a cavity for grain weights in the lid, and spaces for two round weights in the base. See Fig.4.

The beam which currently occupies the box is probably not the original one. That would have had longer shears, with pans more nearly equal in diameter to the spaces provided for them. The right hand space has been filled at a later date by a rather crude block with spaces for more round weights, after which the beam would have had to be stored (as now) with both pans on the left.

The decoration on the top and on the interior of the lid is quite typical, as are the hinges and the main clasp and catch. See Fig. 2. The two small hooks may have been added later, for security reasons. [The lines of I–shaped marks around the spaces in the base are the same as those around the pan socket on the scales of similar date which were made by an unknown maker and owned by Richard Turner until his death. See Fig. 5. Also, I–shaped marks decorate a classic smaller set

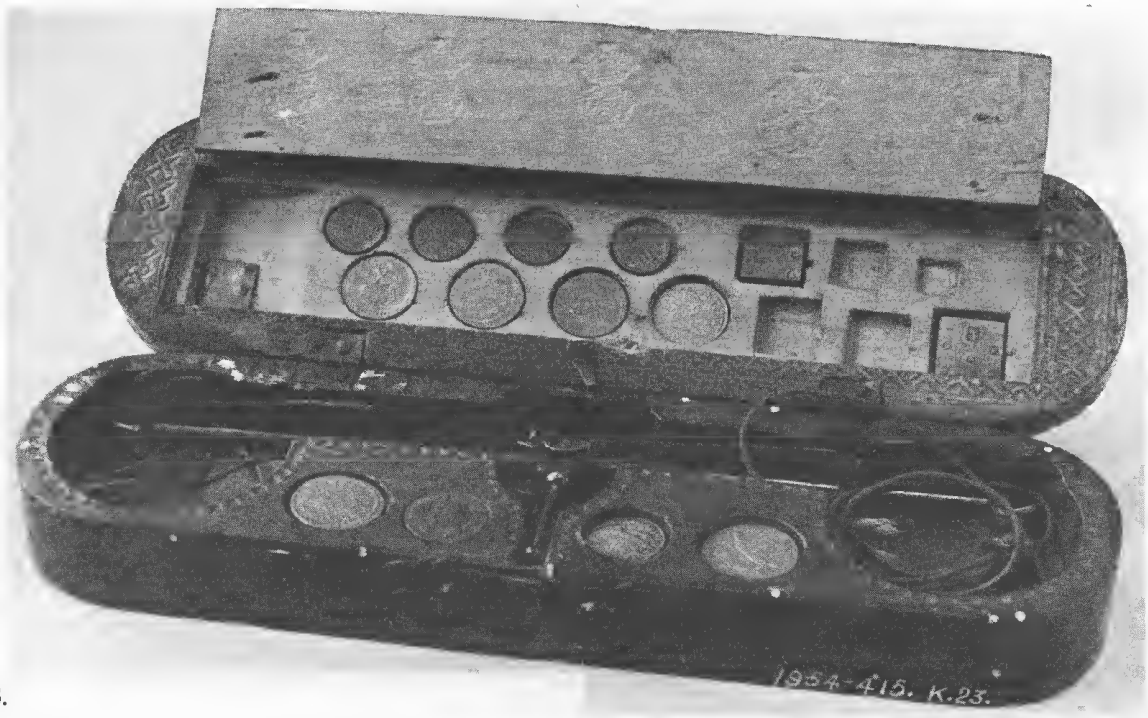
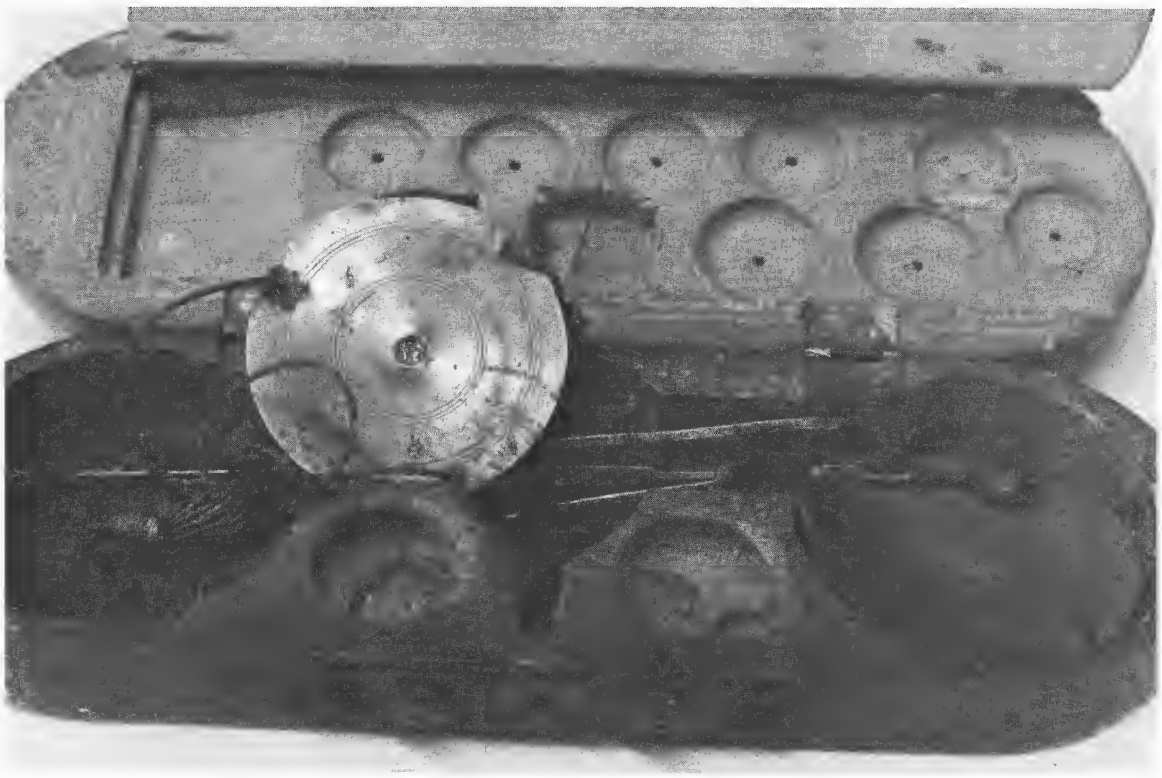


Fig. 3.

of the 1640s made by R*A, in the Wellcome Collection owned by the Science Museum in London. See Fig. 4, and note the many similarities between the box by R*A and the huge box which is the subject of this article, shown in Fig. 1. Ed.]

To concentrate on the weights, a number of the weights currently in the box are contemporary with its manufacture and may be taken as 'original'. As indicated above, the typical set of coin–weights used in England in around 1640 contained no less than twelve weights. Of these, ten are present here, the two missing being the smallest ones. These weights have all the characteristic reverse design of a crown surmounting the value in Roman numerals. The ones which are present are for the unite, half–unite and the crown of James I, (valued at XXII S, XI S, and V S VI D), the angel and half–angel of James I, (XI S and V S VI D), the thistle crown of James I, (IIII S 4 1/2 D), the unite, half–unite and crown of Charles I, (XX S, X S and V S), and the angel

Fig. 4.



of Charles I, (X S). The missing weights are those for the half-crown and the quarter-angel of James I, (both valued at II S IX D). James I reigned from 1603 until 1623 and Charles I reigned from 1623 until 1645.

The nest of weights which currently occupies the well on the right-hand side fits exactly, and for that reason alone may be presumed to be original. A further confirmation is the fact that the mark of the Founders' Company has the spout of the ewer pointing to the right, a variation which has been seen by the authors only on trade weights with a crowned C, (for Charles) countermark. On the trade weights of all other monarchs, the spout points to the left . [This finding is confirmed by the research of M A Crawforth and of A J Crawforth. Ed.] The fact that the weights carry the Founders' Company mark suggests that the set was used by somebody trading in bullion, rather than by a private individual.

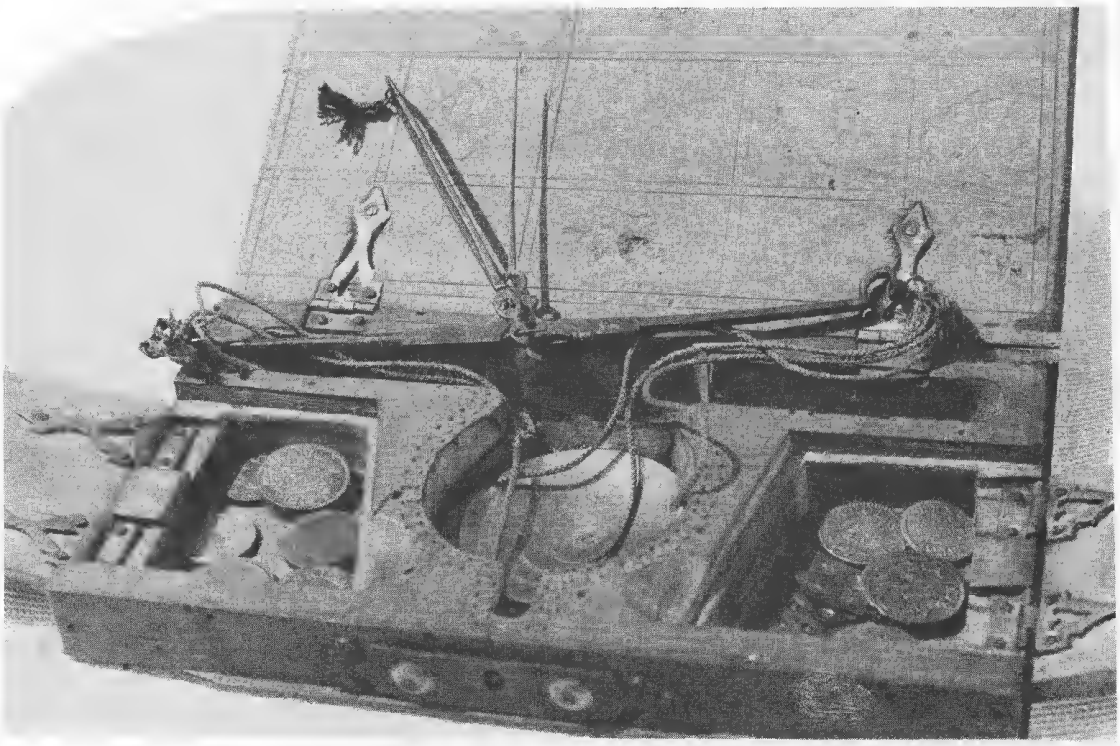
The largest weight in the nest is an English Troy ounce of 31.1 grams, signified by the I and the conjoined TR stamped on the rim; the other weights are the half-ounce, quarter-ounce, eighth ounce and two sixteenth-ounce weights.

It is also possible that some of the square pennyweights and grains are original. The box clearly contains parts of more than one set of those weights, because the type was used for over two hundred years without significant variation, it is difficult to date such weights precisely. Thus, although we list the weights at this point, we do not claim that any of them are necessarily original. There are two 5 pennyweights, two 4 pennyweights, one 3 pennyweight, two 2 pennyweights, one 1 pennyweight, and three 1/2 pennyweights. There are also nine grain weights of various denominations.

We now turn to weights which were definitely made after the box, and which we presume to have been added when it was used for checking coins in later times. First, there are two weights from the time of William III, (1694–1702). At that time, the current coins were guineas and French pistoles, although some of the earlier coins of James I and Charles I, (known at the time as broad pieces,) remained in circulation. The two new weights were for the whole guinea and pistole; frequently weights for the half denominations are found, but they are absent from this box.

The next group of weights is a set of nine dating from around 1762–1773. Many Portuguese gold coins were in circulation in England at that time, and a full set of coin–weights would have contained eleven weights. The two which are missing here were intended for the largest coins,

Fig. 5.



the Portuguese 8 escudo and 4 escudo, valued in England at £3. 12s and at 36s. The weights which are present are for the 2 escudo, 1 escudo and the half–escudo coins, (18s, 9s and for 4s 6d,) the moidore, half–moidore and quarter–moidore, (27s, 13s 6d and 6s 9d,) and the guinea, half–guinea and quarter–guinea, (21s, 10s 6d and 5s 3d.) these are marked on both sides with the value only, and all are clearly from the same set. It seems likely that the box was modified to accommodate additional weights at this time, although, since the broad pieces were demonetised in 1733, there would have been no need, in practice, to retain the weights for them. Perhaps the owner wished to advertise his or her long–standing expertise in financial matters by using an antique box containing some of its original weights.

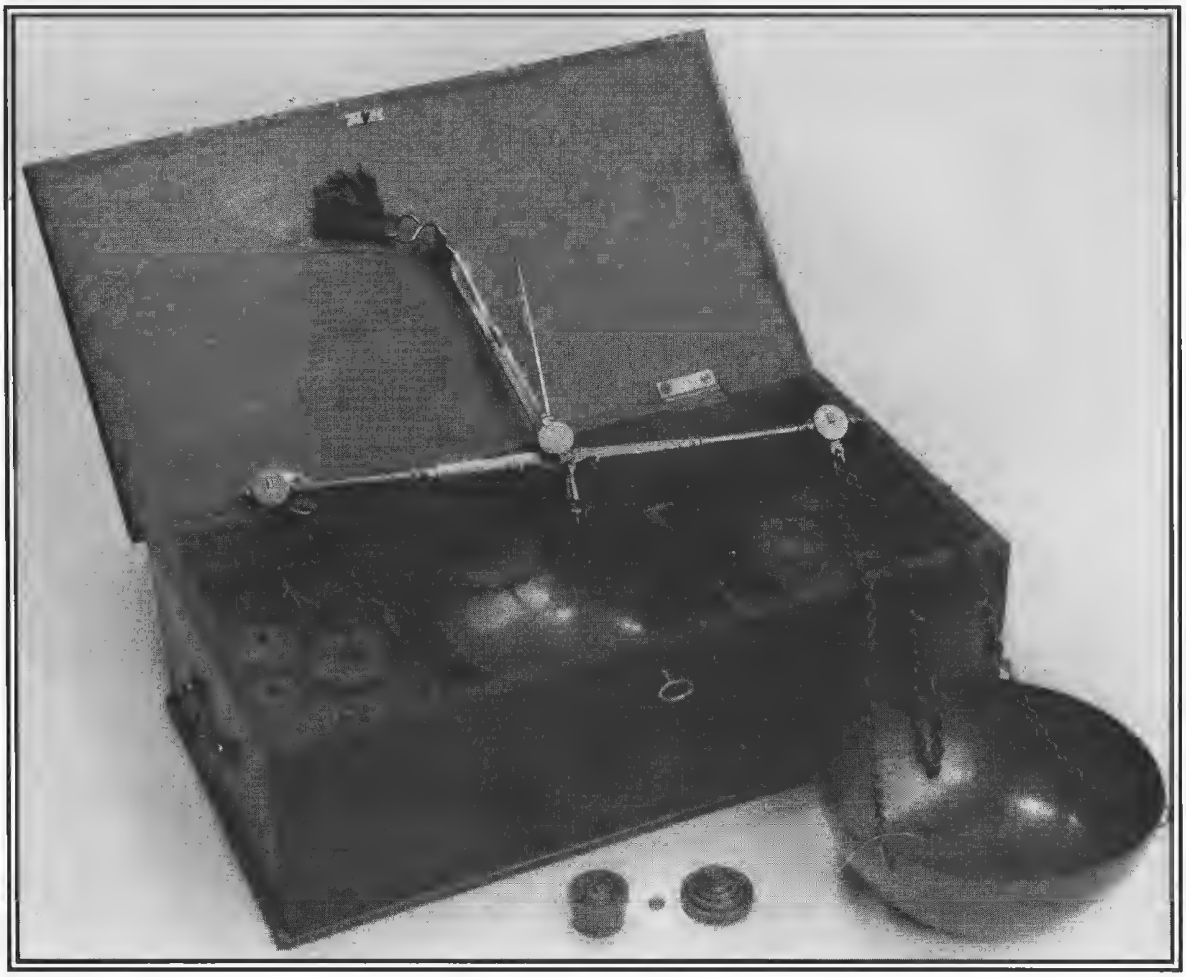
Finally, there is a single guinea weight bearing the portrait of George III, (1760–1820,) and the weight 5dwt 8gr, which indicates that it was made after the introduction of the 'new standard' in 1774. After this time there would have been no reason to use such a large box, because relatively few gold coins were in general circulation. We may thus surmise that the box was put away as a curiosity and retained as an heirloom for about 180 years before it surfaced at Spink's in 1961.

ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

1992—ISSUE NO. 2 PAGES 1553-1580



PAGE 1554

Cover Picture See pages 1577/1578 for full details of this T Beach scale.

Notes & Queries

Query No 115 — from Eugene Mahoney

I have bought a set comprising a fifty gram to one gram weight, with most of what appear to be the original fractional weights. The tweezers are brass plated and the lid has a black plastic tray with circular holes sitting on top of the weights receptacle. The box is 3.2 by 7.5 by 3.9 cm, and the name F HOPKEN & SON. JERSEY CITY, N J, is punched into the right side on the lower half. The hinges are screwed to the back faces of top and bottom.The original one-gram weight is missing, but otherwise it is a nice acquisition.

Can any ISASC member help Gene, please, with any information about Hopken?

Query No 116 — from Mr Gorringe

I saw a huge iron cooking range in a U S A antique shop recently, made by Dearborn. Could this possibly be the Dearborn who made the elegant scales on the cover of EQM, page 1189?

Reply from the Editor

Yes, John M Dearborn made the hunky as well as the delicate. He advertised his air-tight cooking range in 1847, as a cooker that could operate on wood in the summer, when little radiant heat was needed, and on coal in the winter when more heat was desired in the kitchen.

INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

Founded September, 1976

176 West Adams St. • Suite 1706 • Chicago, IL 60603 • Phone 312/263-7500

EQUILIBRIUM is published quarterly in January, April, July and October.

Editor—Diana Crawforth-Hitchins 15 Hawthorn Ave, Headington Oxford OX3 9JQ, England

ISSN-0893-2883

How I Got Started

By W P LINDEYER

When going over the ISASC membership lists that Bob Stein mails to us so religiously with each issue of EQM, it soon became obvious that a wide range of interest exists in the different types of scales that can be collected. While several members specialise, for example, in postal scales or base coin detectors, most do not limit themselves and have collections that include different types of scales. The size and variety of a collection depend not only on financial resources, but also on access to sources. Some members may rely solely on contacts with a few antique dealers in their areas, while others are more fortunate in having the benefit of nearby antique shows and flea markets.

Most collectors are rather undiscriminating when they first become interested, and basically there is nothing wrong with that. It is a good way to learn fast, and besides, some of these early acquisitions may well become good trading material later on. When I became first interested in scales, numbers seemed important and quality came second. After all, I was collecting antiques, and antiques are often less than perfect. However, the collection grew rather rapidly in a short time, and it soon became necessary to limit myself to a specific kind. I like the brass-faced spring balances, and I decided to concentrate on those. Little did I know that many companies made these scales, and soon I had quite an assortment of brass scales made by Chatillon; Forschner; Foster; Frary; Hoppe; Landers; Morton & Bremner; Peck Stow & Wilcox; Pelouze; Sargent & Co; Wilcox; Wilkes and the imported Salters.

I realised that I could not continue to pick up every brass scale in sight without getting hopelessly inundated. Chatillon scales seemed to be in fairly good supply and variety, and offered sufficient challenge within the narrow specialization. So, Chatillon scales were selected for further exploration.

As I expanded my Chatillon collection, I came across scales ranging up to 50lb, then 100lb and even 250lb. I also became aware of the varied designs, and soon it became difficult to keep track of the different scales and their ranges in the collection.

I was facing quite a challenge and admit to getting confused and not a little frustrated. The problem was that I did not know what to look for. Collecting scales is not like collecting stamps which are listed in catalogues showing the complete series and which can be put in albums where the pictures tell you to. An orderly approach was urgently needed; I searched antique shows and flea markets for old catalogues, and I spent hours in libraries. Gradually I came up with some information. Pictures from a 1910 Biddle Hardware catalogue plus descriptive texts were a great help, as was a 1906 Fairbanks catalogue with several pages showing Chatillon scales, much to my surprise. Not long ago I was happy to receive a copy of the Number 19 Chatillon Scales Catalog of about 1924. This has proved to be a valuable reference source.

Finally, I was able to start cataloguing my collection properly. Human nature being what it is, I would probably have been put off working on this rather tedious task, if Bill Doniger had not suggested that I write an article for EQM when he visited me. Of course, it turned out to be more work than I anticipated, but I learned a lot in preparing for this article and that was fun.

Chatillon, Part 1

By W LINDEYER & D CRAWFORTH-HITCHINS

The Chatillon Company was established in 1835 in a small shop in downtown New York, and since then has manufactured all kinds of scales for almost 150 years. The quality of their workmanship must have been outstanding in those early days. At least, they survived, notwithstanding the competition that soon entered the field. They very rarely put their address on their products, but an advertisement in 1915 states that they were at 85–93, Cliff street, New York. Right up to this day scales are made with the company's name on them, although they are no longer made of fine brass.

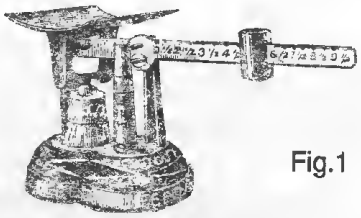
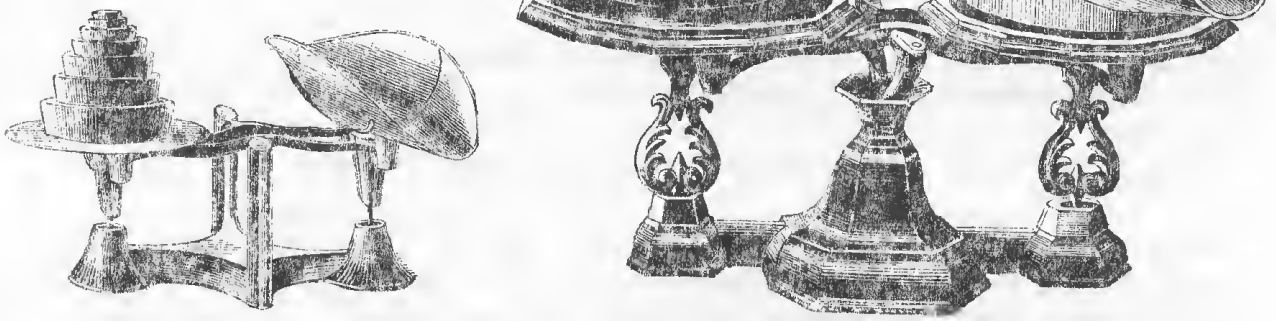


Fig.1

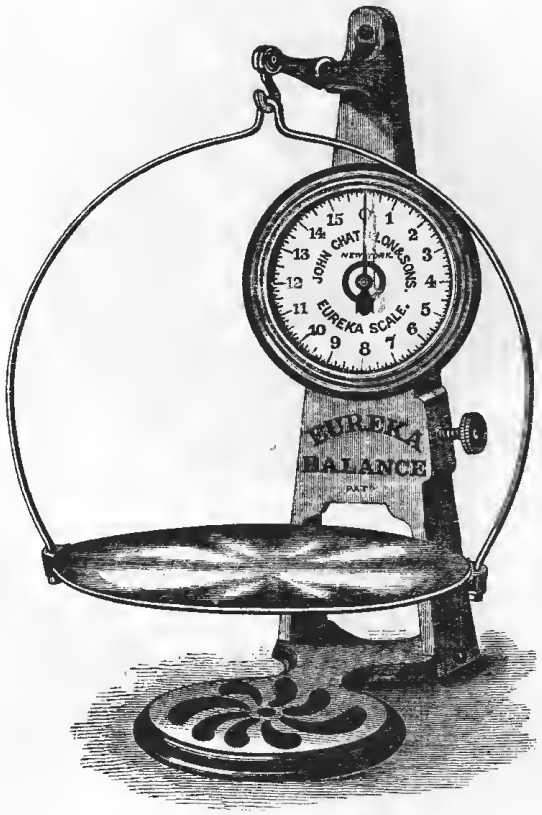
Fig.2

The Company made scales for many different purposes. We have seen only a few pages from their 1880 catalogue, but even those are most instructive. Chatillon sold three steelyards with half-roberval linkage, all for postage, the two smaller ones with a single beam, (Fig.1) and the sturdy one with two beams, the front beam 0–32 oz, and the rear beam 0–4 lb, giving a total capacity of 6 lb, (Fig.2.) Chatillon sold a primitive roberval (Fig.3) to weigh tea, which they wholesaled at a mere $14 per dozen including weights, (virtually the same price as only one of the double beam scales in Fig 2.) The more ornate Hatch Even Balance (Fig.3) had a decorative bulge in the legs that acted as stops to prevent the beam dropping down too far. It was a very

Fig.3



EUREKA SCALES.



SELF-ADJUSTING COUNTER SCALES.

16 LBS. BY 1 OZ.

With Brass Pan and Bows,	each,	$8 00
With Nickel-Plated Pan and Bows,	"	8 75
With Patent Enamelled Pan, with Nickel-Plated Bows,	"	9 00

THE

EUREKA SELF-ADJUSTING SCALES.

PATENTED, OCTOBER 5, 1869.
REISSUED, OCTOBER 1, 1872.

A Special Medal awarded by the American Institute, in 1872.

These Scales have an **Attachment** by means of which a **Dish, Bowl,** or any receptacle used in weighing can be **Balanced** instantaneously **without** the use of **Weights,** bringing the **Index** or **Pointer** back to **0.**

These are the only Scales that are made with the attachment for taking the **Tare.** They are warranted to be accurate and durable, being made with the greatest care, and only the best material used in their construction.

Since we obtained the control of the Patent we have made entirely new patterns, changed the working of the Scale, and have substituted **Hardened Steel Knife Edges and Bearings,** for the round pins which were used by the former manufacturer.

Having made these improvements, we are now making the handsomest, most accurate and convenient Scale that there is in use.

These Scales are carefully packed for shipment, one in a box.

cheap scale at only $36 per dozen including weights, compared with the prices asked by their competitors for similar scales.

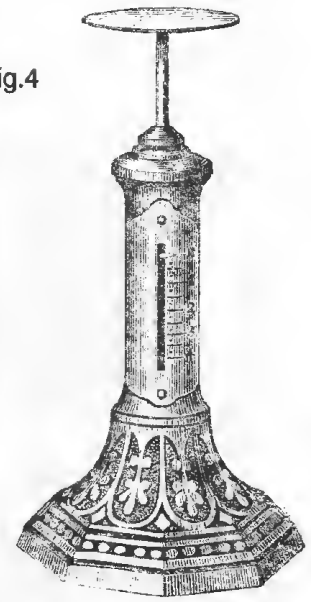


Fig.4

But Chatillon's main business must always have been in spring balances. In 1880, they offered a pretty candlestick postal in Nickel and Verde bronze (Fig.4) for one dollar each wholesale, with a heavy base to act as a paper weight. Although it looks monumental, it is only 6 inches high. They had bought the patent and altered the working parts of the Eureka Balance,(page 1557) a spring balance with the taring screw below the spring balance, the screw operating a system that exerted an equal and opposite force to counterbalance any pan put on the scale hanger.

They made the distinctive and decorative iron Upright Family Scale, (Fig.5) with an attachment for taking the tare, and which had a technically elegant pair of rollers inside the base to facilitate a straight, smooth descent of the central rod (Fig.6). It seems probable that the patent for this candlestick was actually for the rollers.

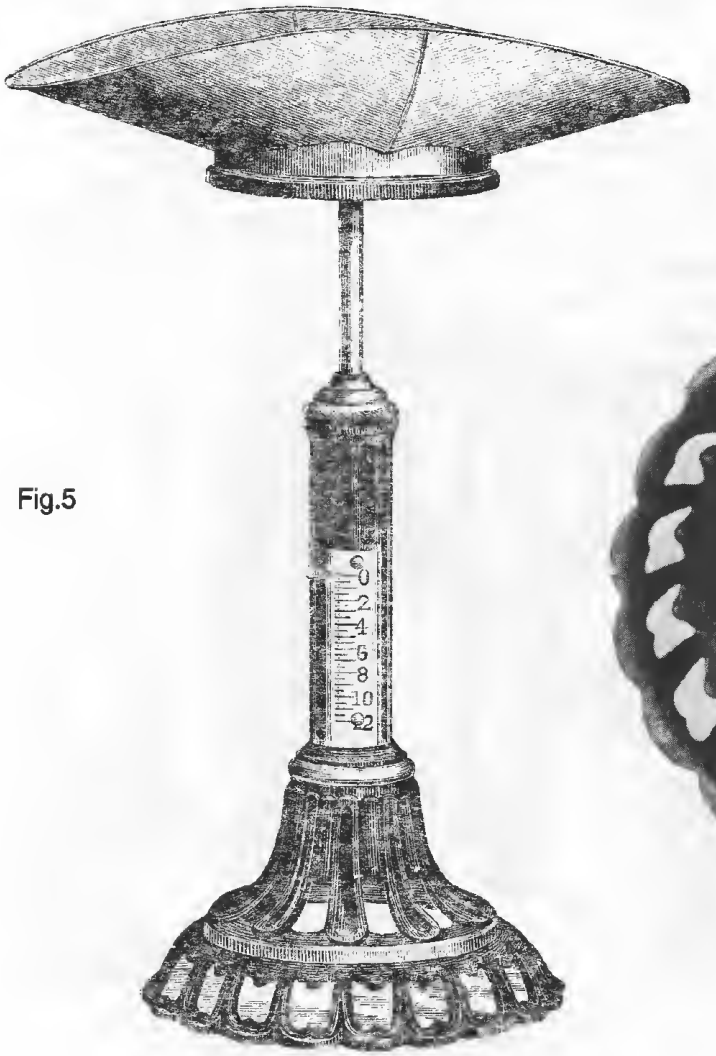


Fig.5

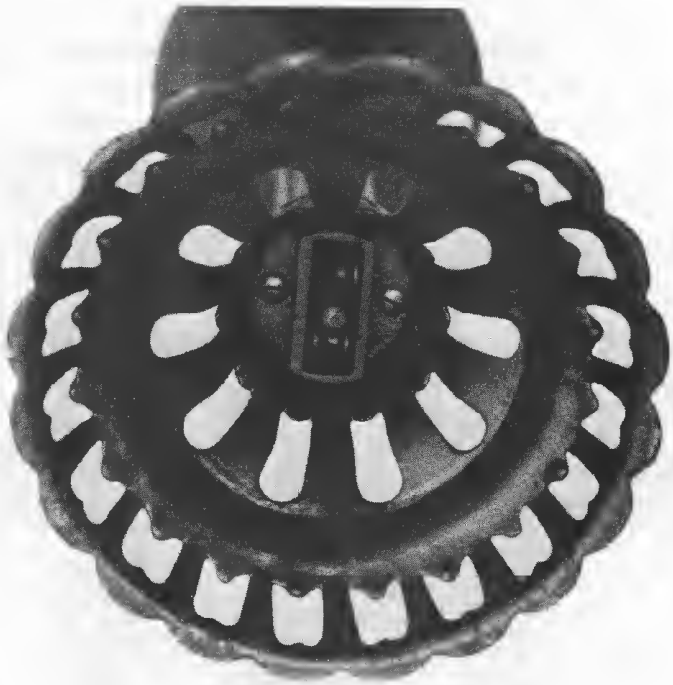


Fig.6

Chatillon printed *'Beautifully ornamented'* beside their Favorite Family Scale,(Fig.8) a boring, boxed-in top-pan scale which was three times as expensive as their Upright Family Scale. [Scale collectors would argue with the writers of the catalogue, greatly preferring to own the rarer large candlestick shown in Fig.7, rather than the chunky top-pan, however nicely Chatillon had curved the base of the box.]

Fig.7

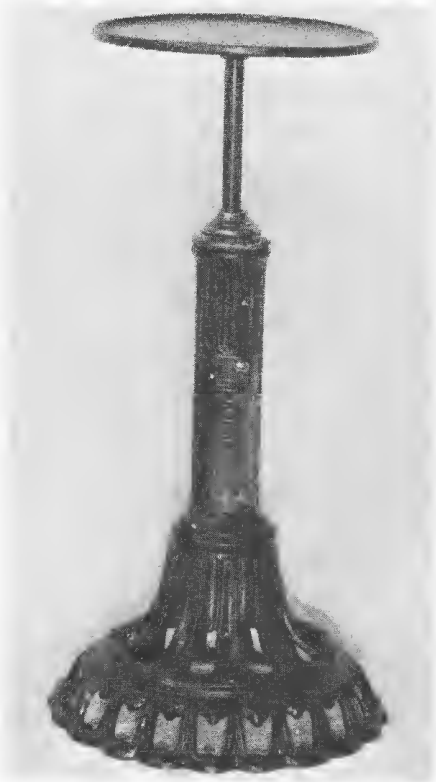
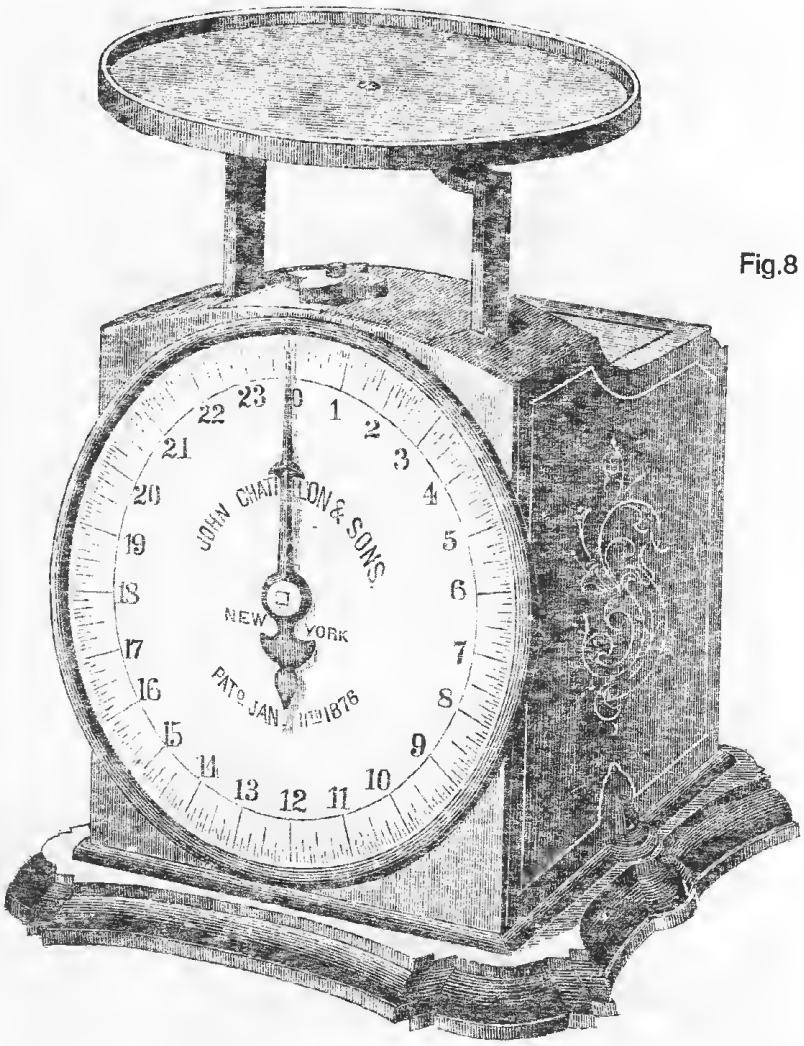


Fig.8



Their slide-and-dial 'Circular Spring Balances' were even more costly, being $15 each wholesale (Fig.9.) Even in 1880 they offered slide-and-dial scales with glass fronts, and the 3279 had an elegant bezel holding the glass. But their 'Walnut Front', number 2277, had to be the most pretentious of all the slide-and-dial scales available (Fig.10.) It was the most monumental monstrosity, very characteristic of its era, and a 'must' for every collection.

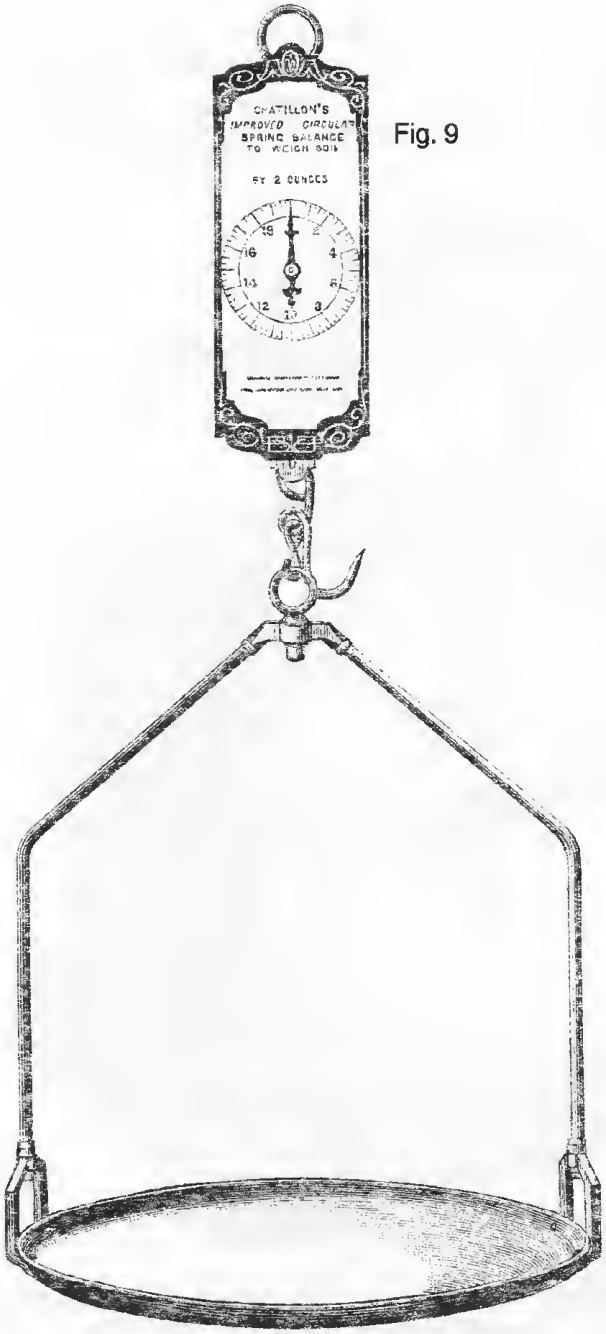


Fig. 9

No. 3279.

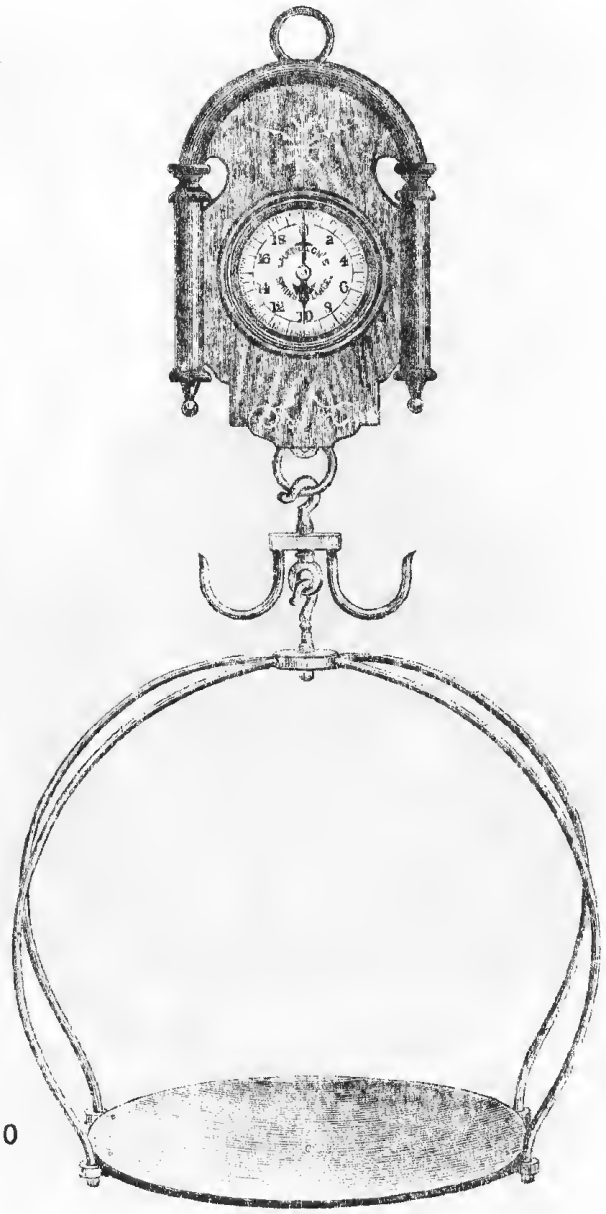


Fig.10

No. 3277.

Part 2 will be in the next issue of EQM.

Earliest English Coin Weights

EARLIEST COIN WEIGHTS FOR ENGLISH SILVER COINS BY G.M.M. HOUBEN

The earliest coin weights for silver coins originate from the Islamic world around 700 A.D. In the beginning they were flat round discs of coloured glass, analogous to those of Byzantium. Around 1000 A.D. coin and money weights made of bronze became more popular and they were made in various designs (4) The best known *European* coin weights for silver coins were produced for the Spanish Reals, or "Pieces of eight" and minted after 1550.

Much earlier, until the 14th century, English silver pennies (with a mass of 22 grains, 1/20th of a Troy ounce, or 1.43 grams) and their foreign imitations were used in many countries. In order to be able to check the mass of these coins, small foldable hand-balances of the earlier Byzantine rocker-type were utilised (fig. 1). [*Ed.note. These are called "tumbrils" because they resemble the tumbril used by Mediaeval courts. A woman suspected of witchcraft would be tied to the long arm of the tumbril, swung over water and submerged.*] In addition, small flat bronze coin weights, stamped with the crowned and ornamented head of the king, characteristic of the penny-sterling, are known. A series of these weights, with the mass of 1/4, 1/2 and 1 silver penny, was written about in 1886, with, however, a wrong explanation (5). [They are at present in the Coin Cabinet of the Bibliotheque Nationale in Paris.] They were the first coin weights for English pennies, used in the Southern and Western parts of France that were occupied by the English. The penny obtained the gallicized name "esterlin".

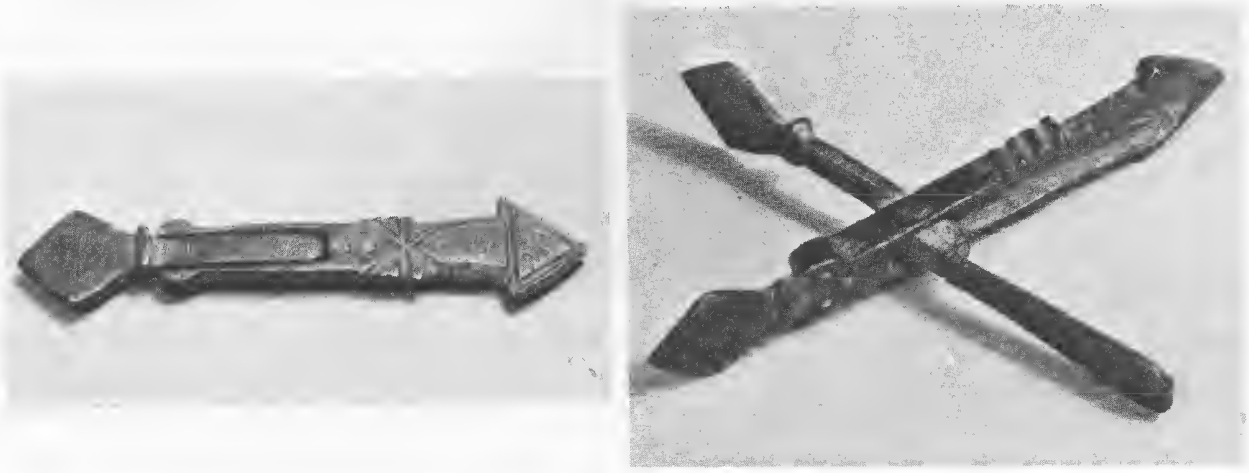


Fig.1

After 1344 the mass of the English penny decreased. In 1351 Edward III introduced a silver groat of 70.5 grains (4.6 grams) (Grueber no.263), as well as a half-groat (2.3 grams), a new penny (1.15 grams) and fractions thereof. Coins with corresponding mass and with the effigy of the king were issued during the Hundred Years War in the occupied part of Western France. However the name of the coins was French;- gros de Calais, demi-gros and denier de Calais. (Grueber no. 278.) A groat had a value of 4 pennies and the corresponding gros a value of 4 deniers. But in the other part of France a gros corresponded to only 3 deniers.

The related bronze square coin weights for a groat and half–groat have as effigy the characteristic crowned head of the English king. A damaged coin weight for the half–groat weighs 32 grains (2.1 grams) (fig. 2). This type of bronze coin weight of square form was only produced between 1325 and 1450 A.D. in Bruges, the most prominent financial centre in the Southern Netherlands, with many banking houses, change agents and money changers.

At the beginning of the 15th century the mass of the English groat and of the gros de Calais were reduced to 60 grains (3.9 grams) (Grueber no.324,) and that of the penny and the denier de Calais to 15 grains. (Grueber no.326.) Until 1453, these coins were current under Henry VI, who was king of France as well as King of England and Wales.

Most coin weights utilised in the occupied Western part of France were designed with a hexagonal form in order to distinguish them from the weights for French coins. The coin weights for one, two and three denier de Calais, with a mass unit of 15 grains (1.0 gram) were all

Fig.2

Fig.3

Fig.4

hexagonal, (fig. 3.) However that for the gros de Calais had a rare triangular form. In the middle, within a circle, is the typical crowned king's head as used on an English penny, and in the corners are three fleur–de–lis of the French coat of arms (fig. 4). Of this type only a few examples are known to the author. The mass of the heaviest (in the British Museum) is 60 grains (3.9 grams). Many speculations have been made on the meaning of this peculiar weight (2).

Note: (Greuber no.X) refers to the numbering system used by Grueber in reference (3) below.

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3. Grueber H.A. "Handbook of the Coins of Great Britain",reprinted London, 1970, nr.324/6, 345/7.
4. Houben G.M.M. "The Weighing of Money", Zwolle, 1982, chapters III and IV.
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Review

by N. BIGGS

Weight stamping by the Worshipful Company of Founders and City of London, text, appendix, illustrations and notes by Maurice Stevenson, 24pp, 1991. Available from Albert Rangeley, 2 Dryden Close, Harrogate HP1 3LP, price £4 including postage.

Maurice Stevenson has produced a splendid little booklet. It combines scholarship with practical details in a manner which will make it essential reading for anyone interested in the history of weights, or in collecting them. Like all good research, it opens up many possibilities for further investigation, and in this review I shall try to draw attention to those which seem to me to be the most important.

The notion that London guilds and companies could be made part of the administrative control of weights and measures goes back to the fourteenth century at least. In a statute of 1300 the goldsmiths of London were entrusted with the task of ensuring that gold and silver wares were of the standard fineness, and as early as 1360 they were also given the task of standardising weights used in the buying and selling of gold and silver objects.

During the sixteenth century there were two crucial developments. First, brass and bronze became more easily available, with price and quantity appropriate for the manufacture of medium-sized weights for everyday use. Secondly, the recurring attempts to provide local standards for weights and measures became gradually more successful, until in 1588 a reliable issue of both troy and averdepois weights was made. These two factors combined to provide the opportunity for the Founders' Company to make a profitable business out of the supervision of trade weights in London. The first known hint of this occurs in their accounts of 1584/5, when we read of a petition to the Lord Mayor concerning weights. A few years later, in 1587, the Company was granted the right to verify 'brazen weights' in London, and stamp them with their mark, the ewer.

There are three published sources of material concerning the early involvement of the Founders with weights. In 1867 W.M. Williams compiled the *Annals* of the Company; this consists mainly of extracts from the Company's records, with little commentary. In 1925, W.N. Hibbert used William's work in his *History*, which remains the basic source. A further contribution was the publication in 1964 of the *Warden's Accounts* for the period 1497-1681, prepared by Guy Parsloe. Maurice Stevenson has used these sources to good effect in his booklet. He tells us of the initial difficulties caused by Warden William Leicester, who, having obtained the rights, tried to keep them for himself, rather than for the Company as a whole. The battles with the Plumbers, who had won the corresponding rights in respect of lead weights, are also described.

Despite these early problems, by the time the Founders were granted a royal charter in 1614 their part in the supervision of weights in London was secure. The ewer mark, together with the royal cypher, dagger and letter A (for averdepois), was already familiar on trade weights in London, and weight-stamping was to continue as an important and profitable aspect of the Company's work for nearly three hundred years. There were many variations in the care with which they discharged their function, and in the procedures for doing so. Stevenson describes these

procedures in some detail. It seems that the pre-eminent role of the Company began to decline around the middle of the nineteenth century, and the Acts of 1878 and 1889, which provided for a network of local weights and measures inspectors and the local councils to supervise them, marked the effective end of stamping by the Founders. The last record of stamping is an isolated case from 1908.

In addition to stamping the ordinary weights used in trade, the Founders were also entitled to verify troy weights and coin-weights. The former were partly the responsibility of the Goldsmiths, but it is not clear exactly how the two Companies carried out verification in practice. Only a small proportion of troy weights have the Founder's ewer mark, whereas rather more of them have a 'lion' mark. Although the latter was the official mark used for hallmarking silver, the actual lion marks which are found on weights are very variable , and it may be that they were simply used by individual goldsmiths to impress ordinary folk who bought their weights from them.

Concerning coin-weights, we do now have a little more information. Some years ago I wrote a series of articles on coin-weights, and I remarked (EQM 1043) that the ewer appears on a few rather scarce coin-weights from around 1700 which bear the name of the maker, rather than the royal portrait. It might be thought that these makers were founders, and that they used the company's mark to give their weights some authority which, not having the royal portrait, they might be thought to lack. Indeed, Hibbert's book confirms this conjecture, for the names of Anthony Giles, Richard Litchfeild, and Samuel Kerrison are to be found therein. Research by Paul and Bente Withers has confirmed that most of the other people whose names occur were also members of the Founders Company, and their work on the complex die-linking of these weights promises to tell us much about the organisation of production at that time.

A bronze weight stamped by Founders Co. after the Act of Parliament of 1826.

With thanks to Lou uit den Boogaard for the photograph

The use of the ewer mark on coin-weights did not continue for more than a few years after 1700, because the weights themselves were little used in the period from about 1710 to 1735. Furthermore, the Founders did not assert their rights during the resurgence of coin-weighing in the middle of the eighteenth century. However, the plans for recoinage of gold in the early 1770's, and the prospect of revenue from the verification of a new series of coin-weights, stirred them to petition for their rights to be mentioned explicitly in the relevant legislation (EQM 1082). Consequently, the ewer is fairly common as a mark on coin-weights of the period 1775-1790, perhaps rather more so than Stevenson suggests, although it seems to be less common than the crown of the Official Stamper of Money Weights and the anchor of Birmingham.

The final section of Stevenson's booklet will be most useful to collectors and others who are interested in the dating of weights. It is a description of the London marks on trade weights from the time of Elizabeth I to Edward VII. By careful comparison and detailed examination of the marks and their placing on the weights it is possible to establish a fairly accurate chronology which, for example, distinguishes the weights of the four consecutive King Georges. Several ISASC members (including the reviewer) have carried out independent studies of this chronology, and it is good to know that their conclusions are broadly in agreement with Stevenson's. The resulting chronology is certainly capable of further refinement, but to Stevenson must go the credit for the groundwork. The reviewer's one major point of dissent concerns the marks on weights of James I, which I believe to be configured in the same way as those of Elizabeth, rather than as shown in the booklet.

In summary, this is an extremely useful publication. It contains much important information about the part played by the Founders' Company in the verification of weights, and it establishes for the first time guidelines for dating based on the marks.

Notes & Queries

Note No. 117 By M. Stevenson

Many thanks for your excellent series on Thomas Beach. I was particularly interested in your last contribution, as I am the owner of one of the steelyards illustrated and described on page 1543. It was not altogether news to me that the original model was made to be remarkably "fast" as I almost disabled myself trying to test my 300-lb capacity, Thomas Beach steelyard for accuracy. The instrument was so unstable that, when gently easing the heavy ball along the arm on to the appropriate graduation, the ball shot along the arm, hit my other hand and narrowly missed my foot. Although quite used to testing butchers' steelyards and other accelerating machines in the old days when I was a Weights and Measures Inspector, I have never experienced anything with so much "power".

It surprised me to learn that you knew all about accelerating scales as I though it would only be old scalemakers and Inspectors who knew about such things!

Mediaeval Bronze Beam

A FISHY STORY

BY M. STEVENSON

In recent years a considerable amount of development has been occurring in the ancient city of Winchester and the authorities have ensured that each site should receive expert archaeological attention. As could be expected in a city established in Roman times and which was once the capital of Anglo–Saxon England, the sites have yielded a considerable collection of interesting finds. Being a frequent visitor to the area through family connections I have done my best to keep in touch with development, especially finds of metrological significance.

By chance I happened to call on Elizabeth Lewis, Curator of the Winchester museums, on a day when she had a most interesting parcel on her desk. Together, we unwrapped it to reveal a newly unearthed bronze scale–beam and shears. Both were in reasonably good condition although somewhat encrusted with the material in which they had lain buried. We carefully measured the beam which, at 54 centimetres, was longer than most ancient bronze beams and I made a drawing (fig. 1).

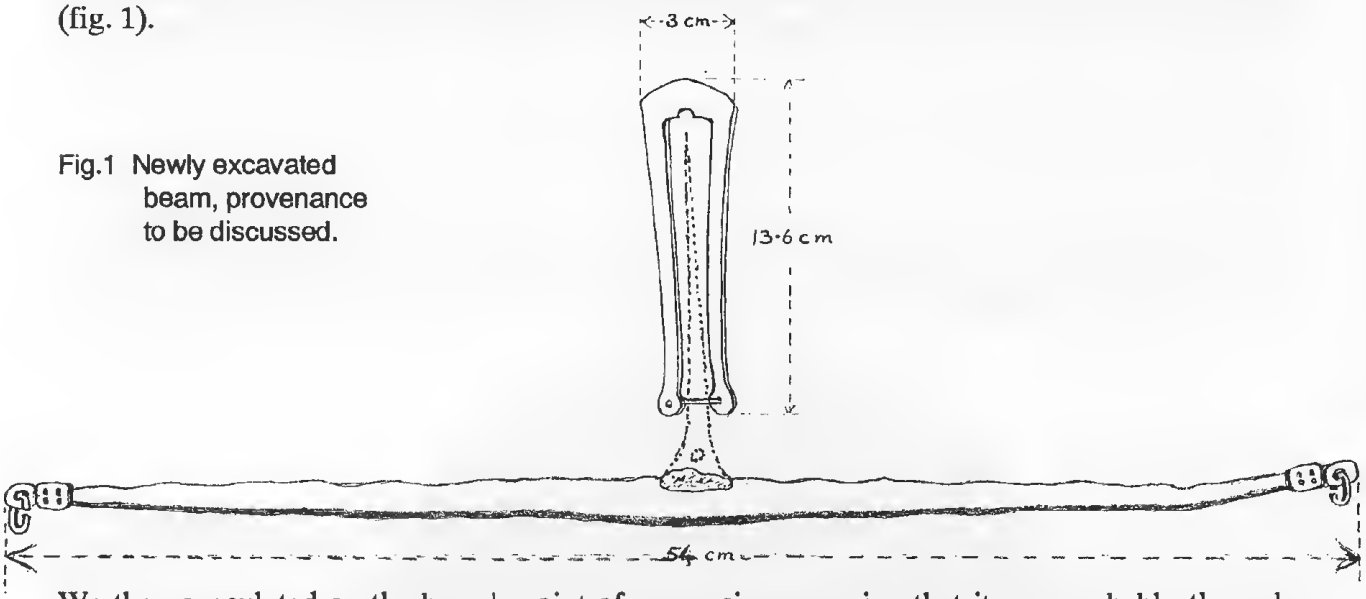

Fig.1 Newly excavated beam, provenance to be discussed.

We then speculated on the beam's point of suspension, agreeing that it was probably through a hole at the base of the missing pointer as shown by dotted lines in the accompanying sketch. This was later supported by looking at other smaller mediaeval bronze beams, including one also excavated in Winchester, and assigned to the late 11th or early 12th century, (see Fig. 2.)

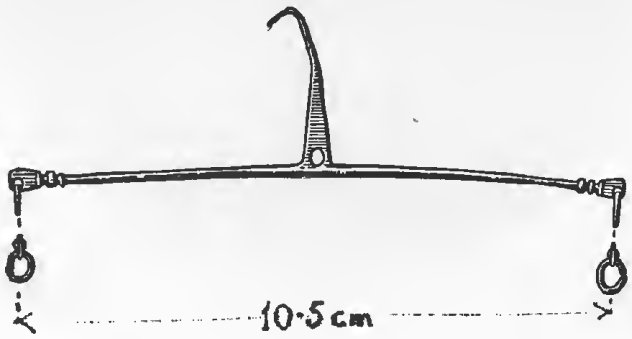

Fig.2 Mediaeval beam circa 1100 AD.

Fig.3 Roman beam
circa 300 AD.

The next question was the probable age of a scale-beam of this type. I immediately jumped in by declaring it to be Roman from the ring-and -hole end bearings, having in mind illustrations in Kisch's 'Scales and Weights' and other sources, [Fig.3, reference 1.] Miss Lewis was of the opinion, however, that it was mediaeval, mainly from the fact that its situation associated it with the remains of a building which had been occupied by mediaeval fish merchants.

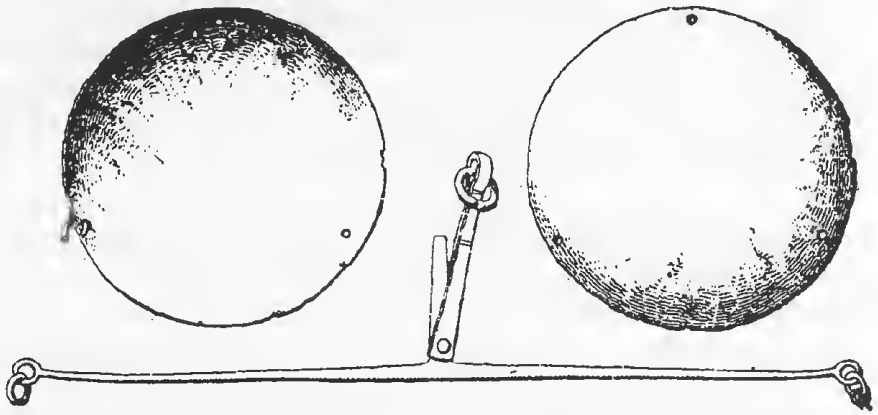

Fig.4 Anglo-Saxon beam
circa 900 AD.

At the suggestion that the scale might have been used for weighing fish I again rushed in to say that it could not have been connected with a fishmonger, as all the references I had seen to the sale of fish in ancient times had been in terms of number, or 'tale' of fish, [reference 2.] In fact, I added that the discovery of the beam on a fishmonger's premises was probably a red herring! Imagine my embarrassment, shortly after, I came across the illustrations of fish stalls of 1417 in Salzman's 'English Trade in the Middle Ages', [Fig.5, reference 3]. Although the depiction of the scale-beams is rather crude, there is a slight indication of ring-and-hole end bearings.

According to an article in the Hampshire Chronicle,[reference 4] the excavation at which the beam was discovered was over the site of a Saxon cemetery at 1 to 2a Staple Garden. Mention of a site associated with the word 'staple' gave rise to the thought that the beam might possibly have been associated with the wool staple and town's weigh-beam which were sited there from about 1353, [reference 5.] Alongside the 'Great Beam' there was often a 'lesser beam'. Could this have been the lesser beam, or perhaps connected with the Assize of Bread? [reference 6 & 7.] Tempting though this idea appeared, further information on the background to the discovery more or less confirmed its association with the fish merchants rather than with the public weigh-beam.

Over the site of the Saxon cemetery there was evidence of a street believed to have been constructed in the 9th century when King Alfred was reorganising the defences of Wessex and laying out a rectilinear grid pattern of streets in Winchester, using, apparently, a module of 4 rods or an 'acre's breadth', [reference 8,] later known as the chain of 100 links. The Alfredian street apparently went out of use in the 12th century when a large substantial private house was built on top of it. The beam was found with other debris from this building deposited when it was rebuilt in the 14th century. Fortunately, records are available of the occupants of the house during the period the beam is believed to have been used there.

In 1304, William de Mune with his wife Christina and Ralph de London with his wife Catherine lived on the premises, where fish was sold. In 1334 the tenement belonged to another fishmonger, Henry le Carevacer. After Henry le Carevacer, the fish business was run by Thomas the son of Ralph and Catherine de London until 1352. From all the foregoing evidence it has been concluded that the scale-beam belongs to the period of occupation of the 14th century building by the fishmongers named.

Discovery of a scale-beam of this type raises a number of interesting questions. Did the bronze beam with ring-and-hole pivots persist from the pre-Christian era into the Middle Ages until replaced by the swan-necked beam forged from iron? A former curator of the Avery museum, [reference 6,] believed that what he termed the "classical" type of ring-and-hole beam of bronze was made and used from circa 1500 BC to 1500 AD, a period of 3,000 years!

Was the Winchester find typical of scales used in Britain for weighing ordinary goods such as fish, and maybe groceries, wax and small ironmongery in addition to its more accepted role in the fine weighing of coins, precious metals, drugs, spices and bread? Most commentators have concluded that the auncel (bismar) was used for small retail transactions in

in the 12th/13th century period. Could they have been unduly influenced by the 14th century edicts banning this mistrusted instrument?

Examples of scale–beams similar to the one found in Winchester – albeit of the folding type – have been assigned to the 11th/12th century in Sweden and 14th century in France. As a virtual common market operated in Europe at that time there is a strong possibility that the beam under consideration was imported from the Continent, especially in view of the considerable amounts of trade carried on through the nearby port of Soüthampton in the Middle Ages. [reference 9.]*

No doubt the bronze scale–beam, along with the better known "Roman" or "butchers" steelyard, spread across Europe with the extension of the Roman empire but hitherto its employment in such common day–to–day trading as that of fishmonger has not been suspected. Perhaps other members of ISASC will be able to supply information on similar finds, so that a better assessment of the extent of use of the "classical" bronze scale–beam in Britain and Europe during the first 1400 years of the Christian era can be made.

References

1..Kisch B.	Scales and Weights, Yale University Press, 1965.
2..	Compendium of Mathematicks, 3rd edition, 1674..Under 'Tale and number of fish to be given to the hundred and thousand, e.g. 'Codfish, haberdine, Ling etc. have 124 to the C *(hundred)*.... Eels have 25 to the Strike and 10 to the Bind.....Herring have 120 to the C, *(hundred)*' It is obvious, of course, that these figures apply to wholesale, and not to retail dealings.
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10..	Photographs by kind permission of the Avery Historical Museum.

* *[Editor's note: Why import scales when they were being made in Britain at that time?*

Perfas – Part 2

Sent by Herbert Grieshaber

Instructions for the Perfas shown on the cover of EQM, page 1525, translated from the French.

The "Utilia" [Perfas] balance is delivered in pieces, so that knocks during transit do not damage the knife edges, always delicate parts of a balance.

Assembly can be done in a few seconds, without tools and without the need to make adjustments of any sort; all the parts simply push together.

Assembly is done in two stages as shown in the diagrams.

Fig. 1. Put the suspension stirrup on the stand, by passing the pointer [I] through the hole [B], hooking the hanger [C] onto the stirrup and putting on the pan. [Hold it in place with one hand.]

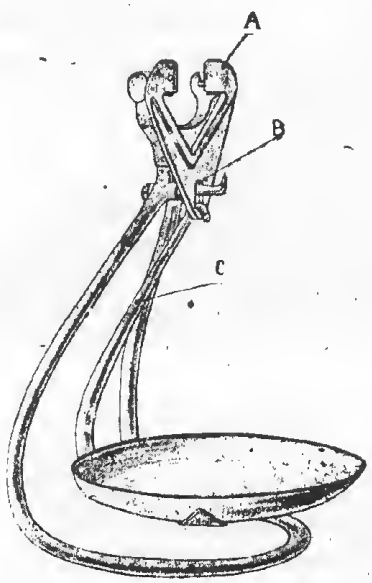


FIG. 1

La balance « UTILIA » est livrée démontée, afin que les chocs du transport ne puissent détériorer les couteaux, organes toujours délicats dans une balance.

Son remontage se fait en quelques secondes, sans outils et sans qu'il y ait un réglage quelconque à faire ; tous les éléments se groupant par simple accrochage.

L'opération ainsi que l'indique les gravures se fait en deux temps.

1° — (Fig. 1) Disposer sur le pied, l'étrier de suspension (A) en passant la pointe d'équilibrage au travers de la boutonnière (B) accrocher le support de plateau (C) et disposer le plateau.

2° — (Fig. 2) Placer l'ensemble (fléau, cadran, contrepoids), sur le support fourchu du pied, en insérant l'étrier comme l'indique la figure.

Accrocher l'étrier sur ses couteaux.

Mettre l'index au zéro, en tournant le bouton moleté à l'arrière du fléau.

La balance doit se trouver en équilibre, les deux pointes (H & J) en regard l'une de l'autre.

Il ne peut se produire d'autre dérèglage que celui qui proviendrait du desserrage fortuit de l'écrou (F).

L'on remet instantanément au point la balance en bloquant cet écrou à l'aide d'une pince, après avoir mis la balance en équilibre et l'index sur le zéro du cadran.

Mode d'emploi

Placer la charge sur le Plateau.

Tourner le bouton (G) dans le sens de la flèche (Fig. 2) jusqu'à ce que le contrepoids l'emporte sur la charge ; puis tourner le bouton dans l'autre sens, par fractions de 10 grammes, les yeux fixant toujours l'index du cadran.

L'équilibre se réalise ainsi en quelques secondes.

Le cadran est gradué par 10 gr. et chiffré par 50 gr., il est donc commode d'en effectuer la lecture.

Chaque tour de l'index sur le cadran correspond à 1 kilog. l'indication du nombre entier des kilos apparait sur le contrepoids à l'arrière du fléau en regard de la flèche (P) la partie fractionnaire en grammes se lisant sur le cadran.

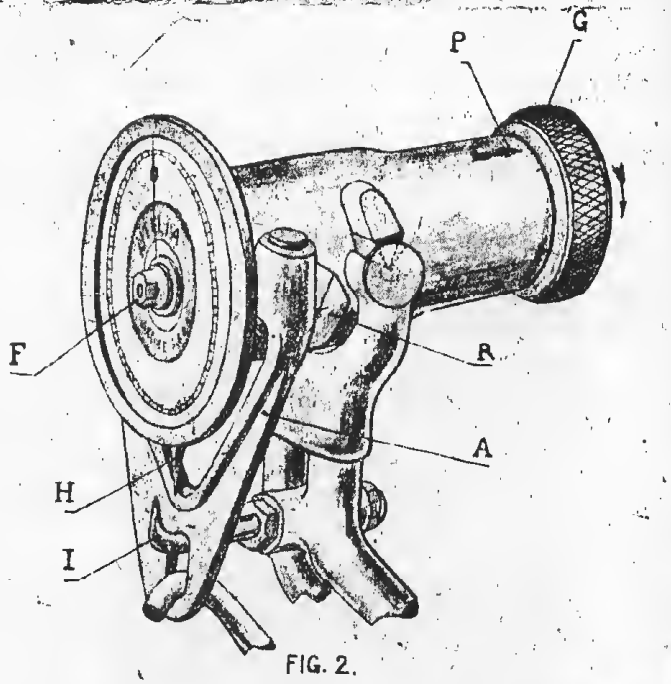


FIG. 2.

Imp. Boéchat. - Montbéliard

The editor apologises for her mis–reading of the name on the scale. It was the PERFAS.

Fig 2. Put the working parts (beam, dial and counter-weight) in the forked support of the stand as shown in the diagram.

Hang the suspension stirrup on the knives [just behind the dial].

Set the pointer at zero by turning the knurled knob [G] at the back of the "beam".

The balance should now be in equilibrium with the two pointers H and I virtually touching.

It should not suffer from any malfunction apart from accidental loosening of the central nut [F].

One can reset a jammed pointer instantly by tightening the centre nut [F] with the aid of a spanner, after putting the balance into equilibrium and the pointer at zero on the dial.

Method of Use

Place the load on the pan.

Turn the knurled knob in the direction shown by the arrow in Fig 2 [clockwise] so that the counter-weight takes the load; then turn the knurled knob in the other direction by fractions of 10 grammes, watching the pointer [H] below the dial continuously.

Balance is achieved within a few seconds. [Then read the weight.]

The dial is graduated by 10 gramme increments, with every 50 grammes marked, to make it easy to use.

Each turn of the pointer attached to the centre of the dial corresponds to 1 kilogram. The indication of the total number of kilos appears on the counter-weight at the rear of the beam, shown by the arrow [P], and the fractions of the kilograms are read on the dial.

Comment by D.F. Crawforth-Hitchins

This is a fascinating and unusual scale. There is no reason why a beam should have to be long and slim, although we tend to notice those beams immediately. This one is short and fat, but it still rocks on nearly central pivot points with knife-edges, as with any slender beam.

There is also no reason why the indication of weight should be on the side of the beam. This one has it mounted flat on the end of the beam, making it a simple job to provide an axis between the knurled knob at the back and the dial on the front.

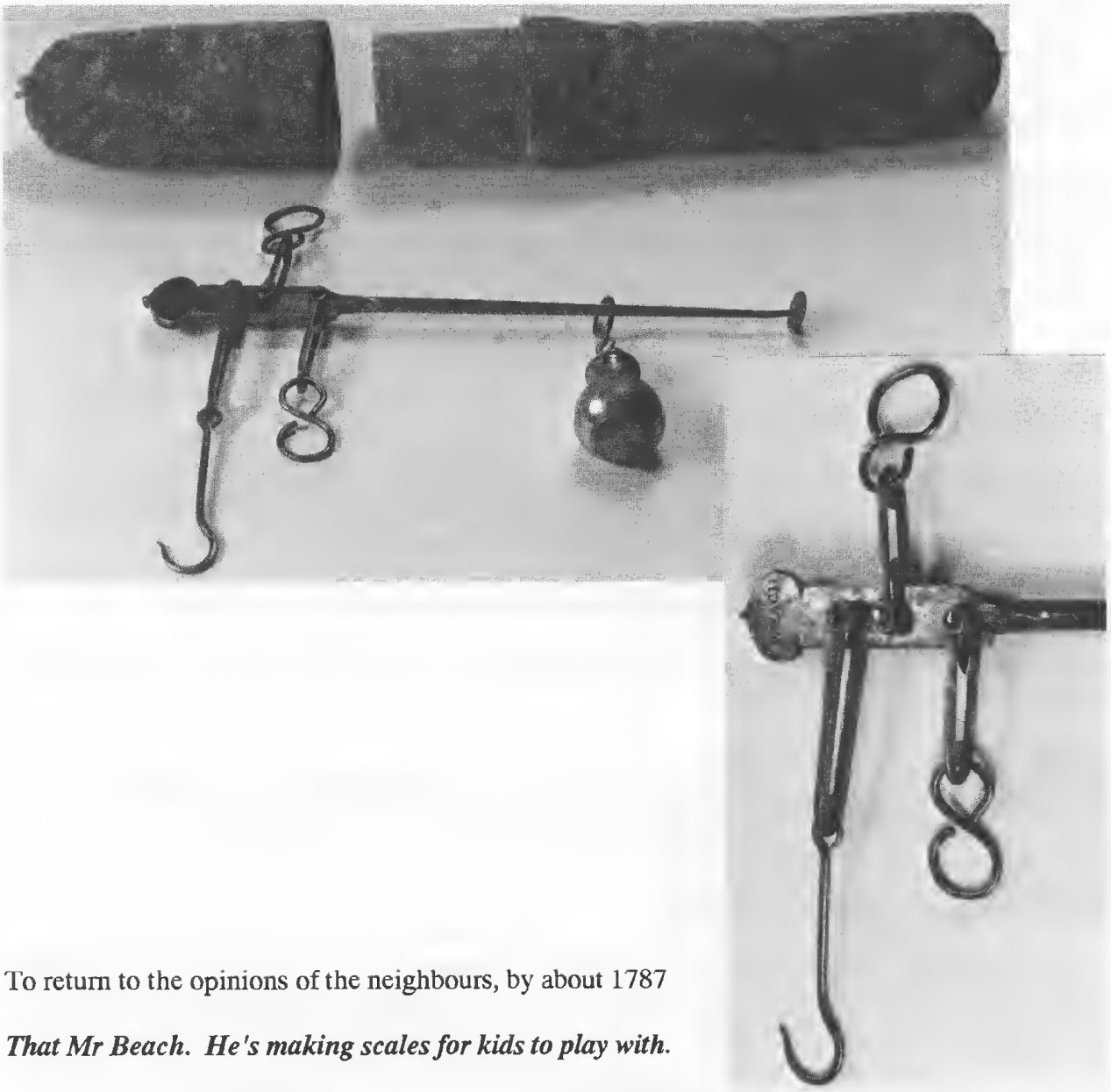
Usually there is a slight problem with centrally mounted beams that are unstable when loading, as they tend to tip unduly, but the problem is solved in the Perfas by putting a fixed pointer (I) through the load hanger, so that movement is reduced to the minimum.

Equilibrium is achieved by screwing the counter weight (contained in the hollow beam) away from the centre, so it must come into the category of telescopic beams.

Thomas Beach Part 3

WHAT THE NEIGHBOURS SAID

By D F CRAWFORTH-HITCHINS



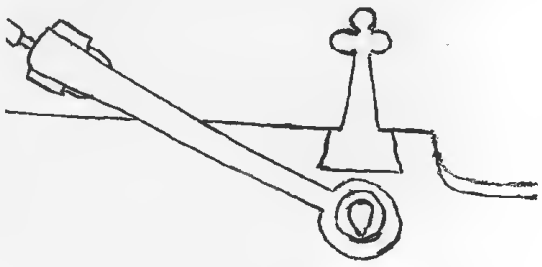
To return to the opinions of the neighbours, by about 1787

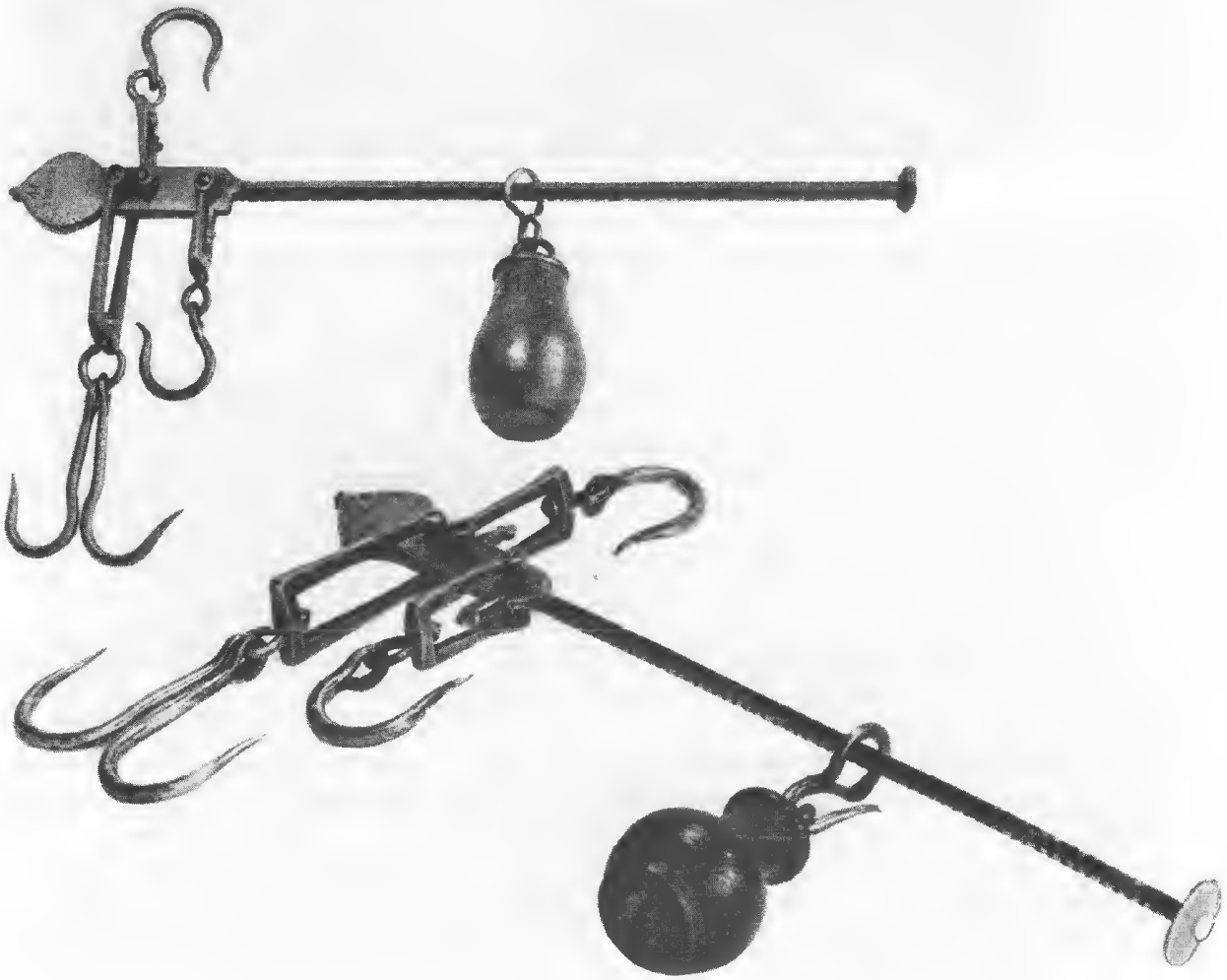
That Mr Beach. He's making scales for kids to play with.

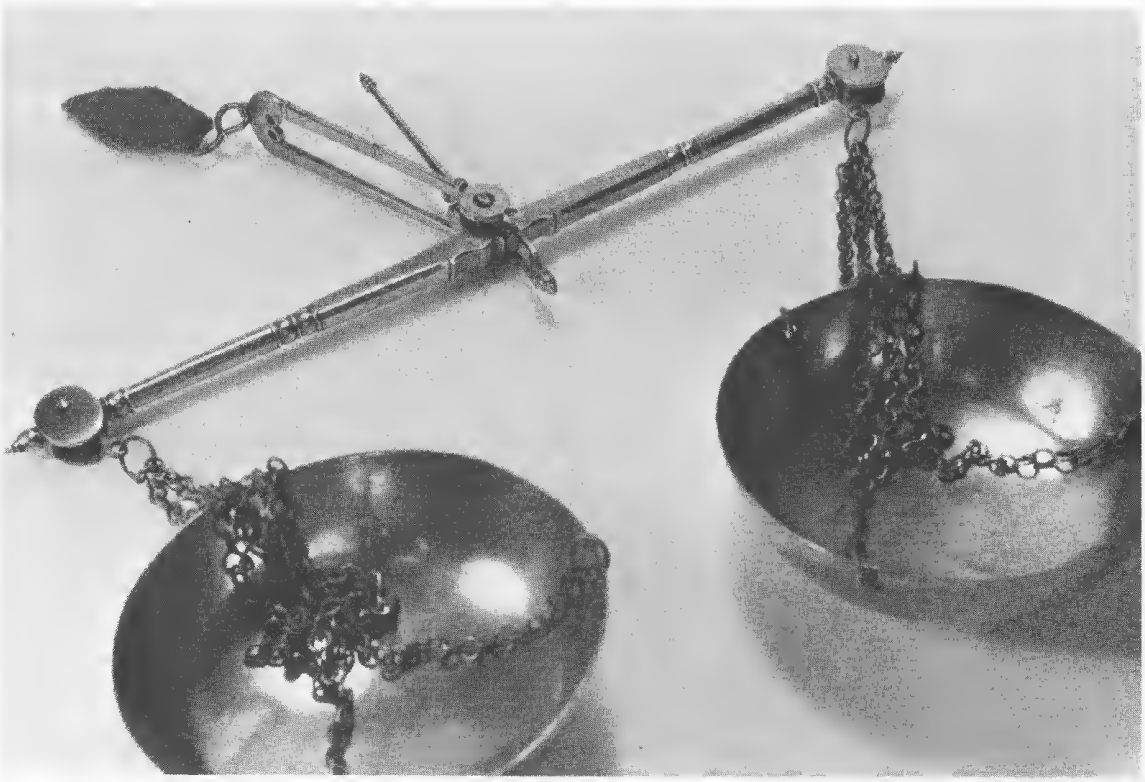
This steelyard was one of the smallest he offered – to weigh 34 ounces – and only 8" long, stored in a paper, cap-end case. The pivot points are not properly aligned – that is, they are not the "improved" variety – the light side of the beam weighed 1 – 9 ounces and the heavier side 8 – 34 ounces. The brass ball is solid brass, lacquered with saffron lacquer, giving it a vivid golden appearance. It is difficult to imagine what such a delicate little tapered beam was useful for, as it would weigh only 34 ounces under strain, and then not very accurately. Surely a customer would have been better off with a boxed equal arm scale? The neighbours were right to be a little scathing, but no child would *really* have a toy stilliard costing 3/6, the weekly wage of a skilled man.

The upper steelyard is a small 15 inch, (38 cm.) trade steelyard made entirely of iron. The poise would originally have been painted with red lead, a terracotta coloured paint. It has 1 1/4 cast into the side of it, although, in fact, it weighs 1 lb. 5 oz including the weight of the integral ring. The flattened knob (which counterbalances the weight of the beam itself,) was stamped 46 T BEACH, indicating that the steelyard had a maximum capacity of 46 lbs, divided between the lighter side 8 oz–10 lb, and when turned over, the heavier side 10–46 lbs. The load hooks swivel under well–made knobs that give that little bit of elegance to a basically plain and functional object.

The lower steelyard is nearly as long, being 12 inches, (30 cm.) but it is stamped 16 T BEACH, so has a maximum capacity of only 16 lbs. The poise still bears traces of red lead, but it has no numerals cast into its side. It weighs 9 1/2 oz, and it is detachable from the beam. It must have been very easy to lose the poise, so that the owner needed to take the steelyard to a steel–yard maker and try to buy a new poise that registered correctly. How inconvenient, and how often did the owner make do with one that was only approximately correct, or even that was intentionally fraudulent? Being 'white',that is shiny iron, it is possible to see how nicely Beach inset the pointers with a wedge–shaped tongue into the body of the beam.







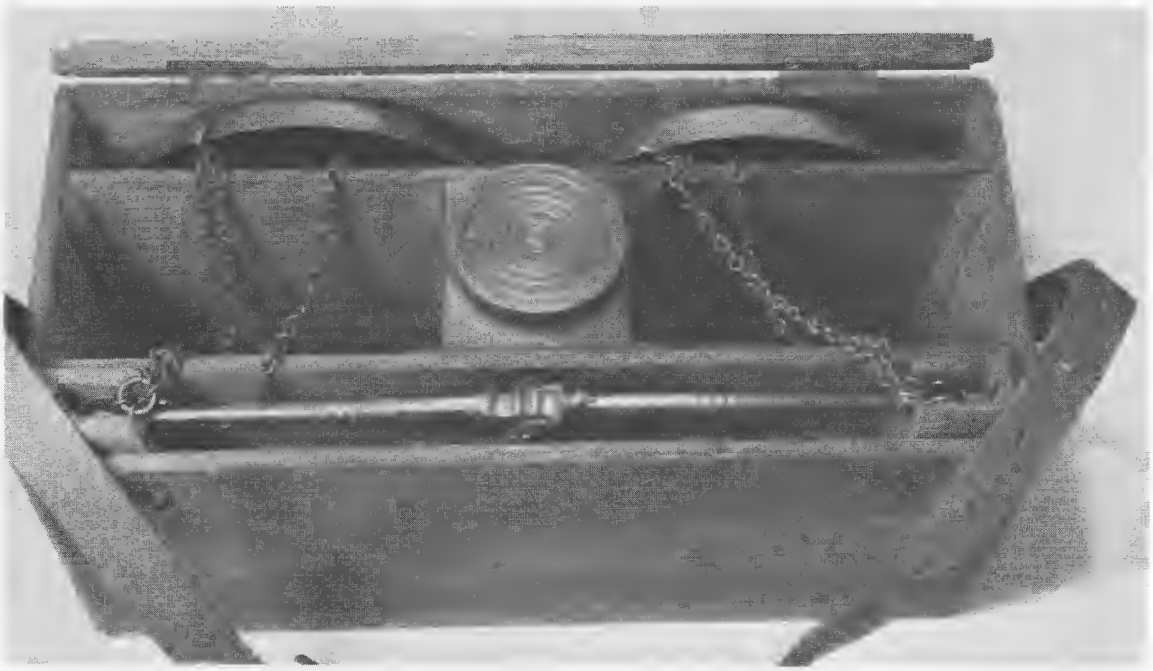
The beam above may seem too simple to be included, but it emphasises an important aspect of Beach's business. **He made scales for traders.** He made huge scales for crude loads, tiny scales for traders to check their gold coins and he made middle-sized scales to use in shops where the customers wanted the reassurance of seeing their expensive buys, (like sugar, tea and tobacco,) weighed in front of them. This high-quality box-end iron beam is 10 1/2 inches long, (24 cm,) has robust brass chains, deep copper pans and a pointer (cock,) screwed into the central boss. It would have rested on the counter of the shop until loaded with both weights and product, then lifted up by its leather tab to check the weight. Because so many of these well-made beams have survived, collectors tend to overlook the beauty of their construction, and under-estimate the investment made by shop-keepers in buying them.

By 1797

I've just heard that Mr Beach is retiring. Bit young - only 52. Expect he wants to breath country air again. Lucky his niece's husband is in the trade.

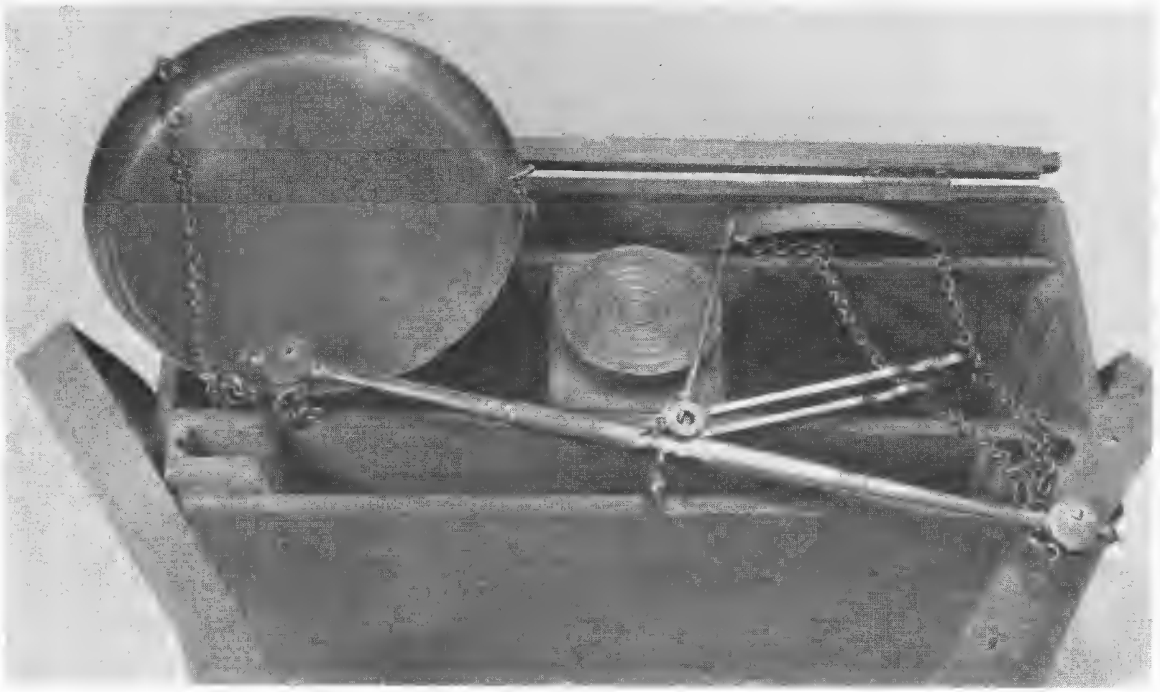
Although Broadbent, in "The Avery Business" stated that Thomas Beach retired in 1799, Joseph Balden was in trade directories in 1797 at 11 Digbeth, so Thomas Beach must have retired in 1797 or earlier.

Joseph Balden was a mature stilliard maker who was married to Mary Avery, one of the 16 children of Mary Beach (Thomas's sister) & John Avery. No doubt Thomas Beach felt that Joseph Balden was a suitable member of the next generation to take over his prosperous business.



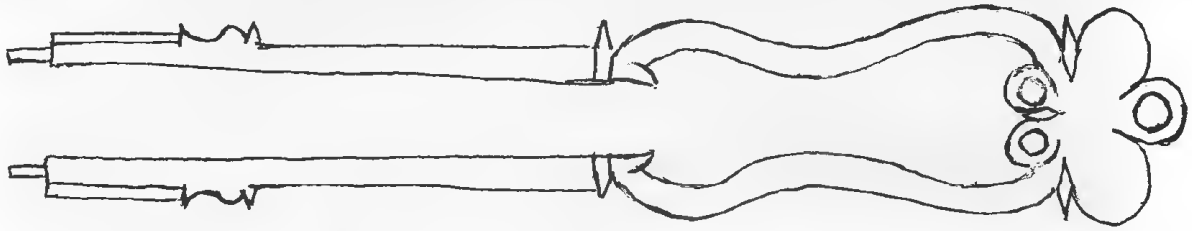
The tall, narrow box shown in these two photographs is a most unusual set. The oak box is 8 inches high, (20 cm.) 7 inches deep, (17 cm,) and 15 1/2 inches long, (37 cm,) with robust leather straps to carry it with. Internally the box is divided into a slot at the front, (into which the beam drops, upside down,) a slot at the back, (into which the pans drop without allowing any movement,) and a central block with a depression turned in the top, (into which the Troy nesting weights fit.) Each side of the block is a deep hole suitable for a box to be fitted, but no clues survive to tell us what was kept there.

Such a portable box implies an inspector going round checking on something– possibly on weights– in which case he would have needed lead for adjusting, with a small heater and container for the lead, and the tools to stamp the weights after adjustment. Could the side boxes have contained such tools?

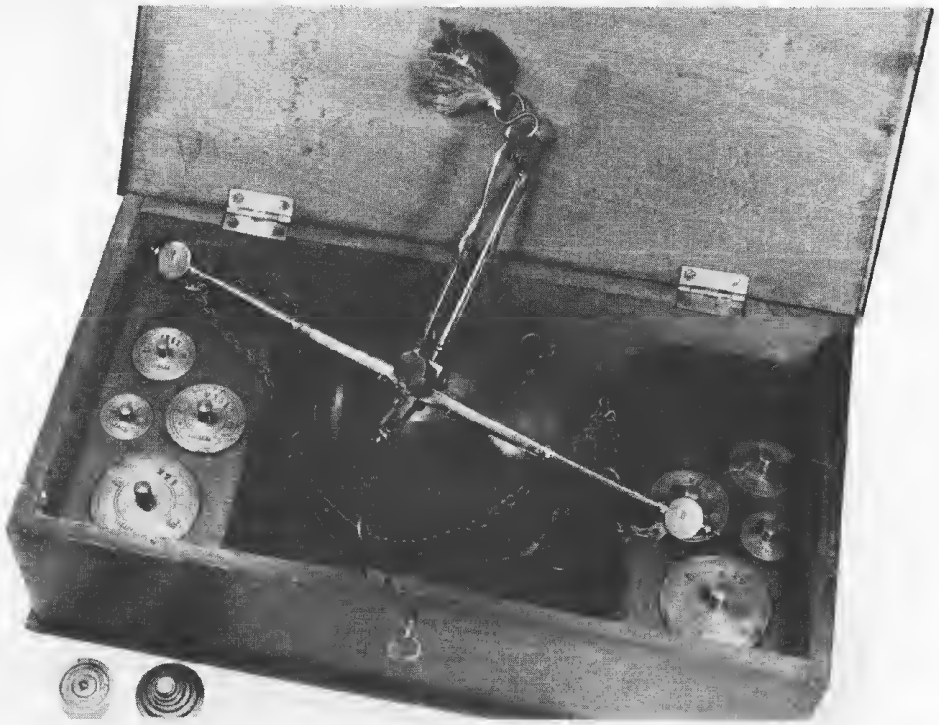


The bronze nesting weights are each stamped twice with a TR conjoined, and twice with a lion, the mark used by Goldsmiths' Company when they verified weights. The largest weight is for XVI ounces Troy, and the two smallest are for 1/4 ounce Troy. They have been adjusted by turning some bronze off the bottom of each cup, and by inserting a lead plug into the base of the central weight.

The polished beam is of exceptional quality, having the shears with a double curve each side of the pointer. The substantial chains seem far more robust than are needed to support the total of the weights

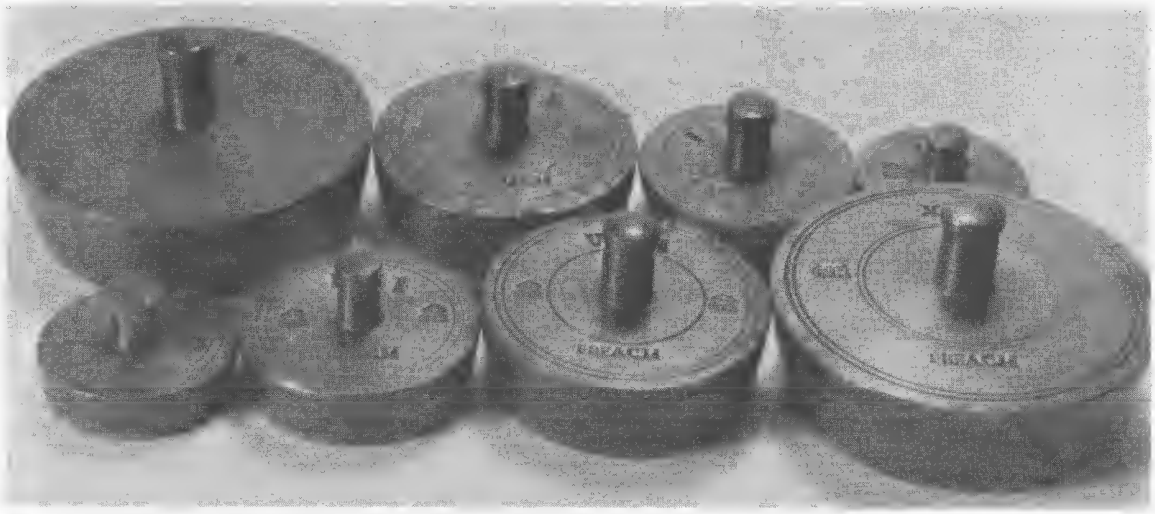


and the load– 5 lbs 4 oz. Troy. The pans also seem very large for such a small load, so that one begins to think that accuracy and prestige had more to do with the presentation than practicality.

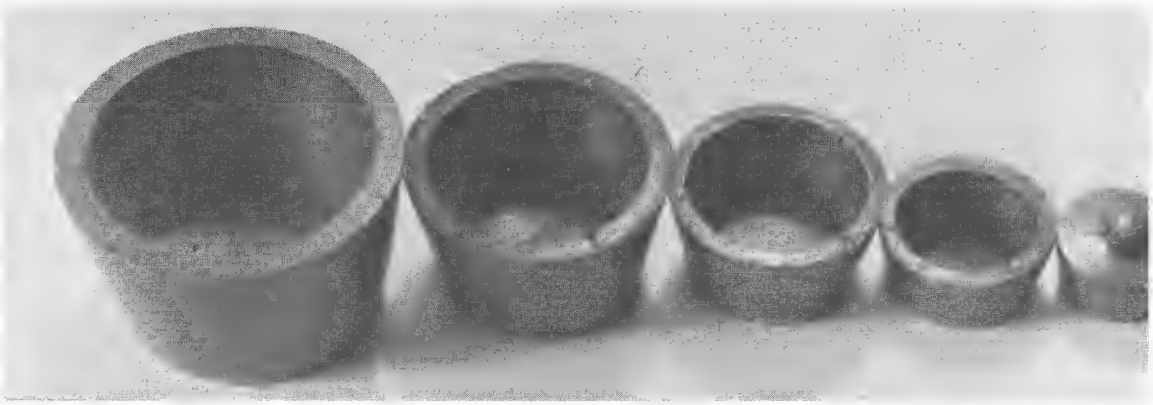


Joseph Balden had his children spread over many years. He watched his eldest daughter, Elizabeth, marry her cousin, William Avery, and saw his elder son, Joseph, grow to young manhood, but his little baby Samuel was only two when his father died, in 1813, intestate. The business went, naturally, to the elder son Joseph, who was then 18 years old, but he was untrained and incompetent. The family got together and Joseph Balden turned the business over to his elder sister's husband, William Avery, with Thomas Beach as one of the three trustees. Thomas Beach must have been worried about the prospects for the business, as William Avery was a mercer and draper, not a scalemaker, but with the help of Thomas, William's younger brother, the business flourished from 1816, when William Avery legally paid 5/–, (for a business that was to employ 200 people in his lifetime, and supported his large family in fine style.)

The scales on the previous page, shown on the Cover and in more detail on this and the following page, were Michael's most expensive purchase ever, (except for car and house purchase,) and he greatly appreciated their rarity and their fine workmanship. The polished mahogany box, with its brass carrying handles, is 18 inches across, (45 cm.) 5 1/2 inches high, (13 cm.) and 9 1/4 inches from back to front, (23 cm.) A drawer is set into each end, which opens into the interior of the box. This arrangement has prevented the tiny weights from being lost. The large weights are set into the blocks which form the top of the drawers, and are unusual in being two identical sets of knobbed averdupois bronze weights for XVI, VIII, IIII and II ounces, stamped with a crowned GR, and with T BEACH. Nobody has yet been able to come up with a convincing reason for having two identical sets of weights.



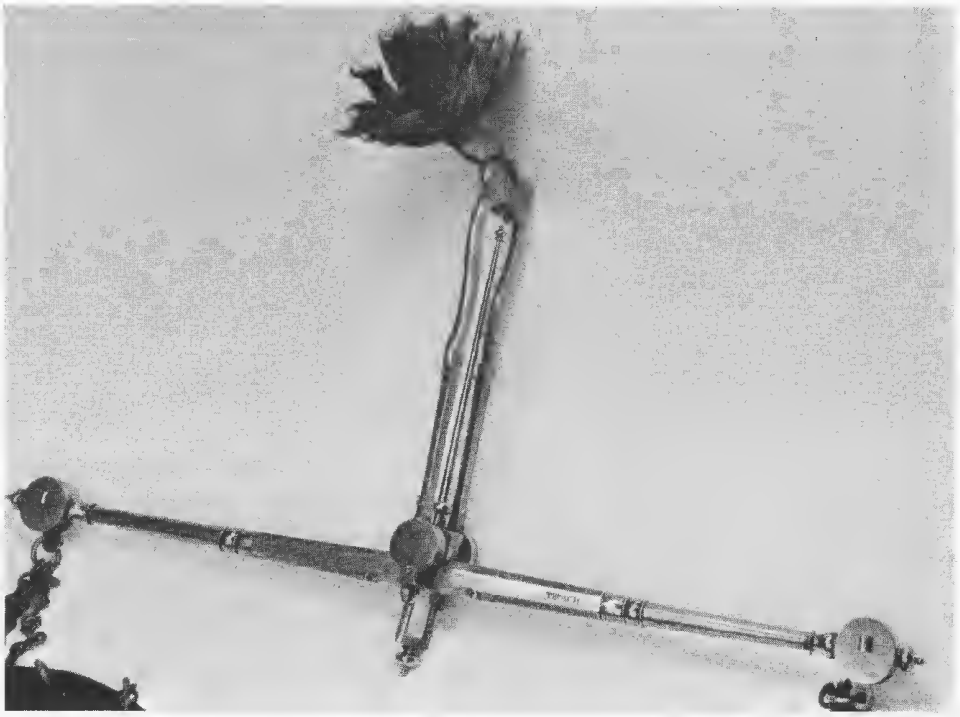
The little nesting weights set was in one of the drawers, and has the same crowned GR stamp as the knobbed weights, although they are not stamped T BEACH. The weights show signs of having been gilded originally. They are for II, I, 1/2, 1/4 and a 1/4 oz Troy.



The flat bronze weights shown on the next page, are the continuation of the knobbed set, going down 2, 1, 1/2, 1/4, 1/8, 1/16 (1 dram,) and 1/32, (1/2 dram,) ounces Averdupois. The last one is an addition, but all the others have the matching crowned GR stamp. They have no units stamped on them, which must have made it all too easy to make a mistake in adding up the total of the weights used. No grain weights have survived, but presumably anybody using dram weights would also have wanted a set of grain weights as well. The drawers are so big,[being 7 1/4 inches (185 mm.) by 1 3/4 inches (50 mm.) by 3 1/2 inches, (90 mm.),] that tools or even another little scale could have been kept in them. The drawers, the base of the box and the interior of each well for the knobbed weights was lined with hand-cut maroon velvet, giving the box a well-finished look.

It is difficult to convey the quality of the beam in a photograph. It is exceptionally large for a polished beam, being nearly 15 inches long, (360 mm.) and its great size enabled Thomas Beach to finish every detail with rare precision. Every pip, every curl and every finial is crisp, sharp and extended to its limit. The central pivots are covered by inverted-tulip-shaped dust caps, and the box ends are subtly oval, not round. The shears are the same unusual shape as on the previous beam discussed, and, given the paucity of evidence so far, may be called a Thomas Beach speciality.

The silk tassel was originally bright chestnut, gold and dark green. The chains are brass, with deep, hand-beaten hemispherical pans. The advantage of hand-beating the pans was that the sides could be raised up very high without making the copper brittle. [Anyone with a shop scale scoop that has split will recognize the inferiority of a pressed copper pan.] The whole kit only just fits into the mahogany box with meticulous arrangement of the chains, so that, when it is locked, the box can be carried without any movement whatsoever by the contents.



Given the great importance of W & T Avery in the history and development of scales in Great Britain, it is interesting to see the label in their coin scales shown below. William and Thomas Avery economised by continuing to use the block made for Thomas Beach, but they had it altered to read "W & T AVERY, Late BALDEN, Successor to T BEACH," They were still at the old shop at no. 11 Digbeth when these coin scales were made, but by 1835 they had moved to 12, Digbeth and expanded to premises at 5, 6 and 26 Moat Lane. Prosperity was coming for the Avery family, but they still harked back to the golden age of Thomas Beach.

In 1824

Is Mr Beach dead? We'll see no more like him. Remember his superb specials? Hope his widow keeps an eye on the business.

Thomas Beach lived long enough to see the great revival of his business, with William and Thomas Avery boasting that they had taken over his business "W & T Avery, Late T. Beach". Did she have a scale by which to remember her lively husband? Perhaps a scale like the one on the cover?

In 1834

The old lady's died at last. 96 she was. She's seen some changes in her life. Five kings she's seen. Canals, factories, railways;– and a husband who knew how to get the best from them.

In 1836

I thought we were starting a great new age of morality with our young Queen Victoria, but I hear that greedy young Samuel Balden thinks he's old enough to take on the big guns. He's brought a Court case against the Averys, but he won't win. He won't be able to prove that his elder brother was unfit to execute a legal document when he sold the business to the Averys.

After all, Joseph is bright enough now, and he still trusts the Averys. But Samuel wants the business, and you can't really blame him, thriving again like it was in the days of Thomas Beach.

This lecture was given at the convention in Chicago in May, 1991 and repeated at the meeting in Boroughbridge later in that same May.

Thanks are offered to Mr. Green, the curator of the Avery Historical Museum, for his help with illustrations. Much further information may be garnered from 'The Avery Business' by L H Broadbent, published by Avery's in 1949.

The author would greatly appreciate receiving information on any other Thomas Beach scales that have survived, with details of size, function and container.

Fire Gilding – Ormolu

By D F CRAWFORTH-HITCHINS

Gilding was rare in the 18th century, as it was both expensive and dangerous to the health of the gilders. It is difficult to imagine why Thomas Beach should have obtained gilded nesting weights, unless there was some risk of corrosion when the nesting weights were used. Possibly the weights were gilded purely to give extra prestige to the owner, but the whole box and the quality of its contents would surely have enhanced his prestige without the need for gilding.

Fire gilding was dangerous because the workmen had to heat powdered gold with six times its weight of mercury, then press the viscous fluid through a chamois leather. This removed the superfluous mercury, leaving a paste with the consistency of butter, composed of about two parts of mercury to one part of gold. The weights were brushed with mercuric nitrate, and then brushed or coated (using a gilding knife,) with the gold and mercury paste. The weights were placed in an oven and heated until the mercury evaporated. The surface of the weights was now covered with virtually pure gold, which could be burnished, matted or heated with other chemicals to change the colour of the gold slightly.

The average life span of a gilder was under 30 years, as the inhalation of mercury fumes caused madness, followed inevitably by a very early death. [For those familiar with Alice in Wonderland, the Mad Hatter is certainly based on a hatter suffering from mercury poisoning, since hatters also used mercury in their work.] As soon as electrolysis was discovered in the 1830s, gilding was achieved by that means, and gilding became a much cheaper and safer process, much used on decorative desk sets, as postal scale collectors know.

S Mordan made extensive use of gilding on his scales, particularly on the ones with an oval base and a rope round the edge. If you examine your gilded scales, you will notice that the areas still covered with gold are fully protected from oxidisation, even though the gold layer is incredibly thin. So gold was useful as well as decorative.

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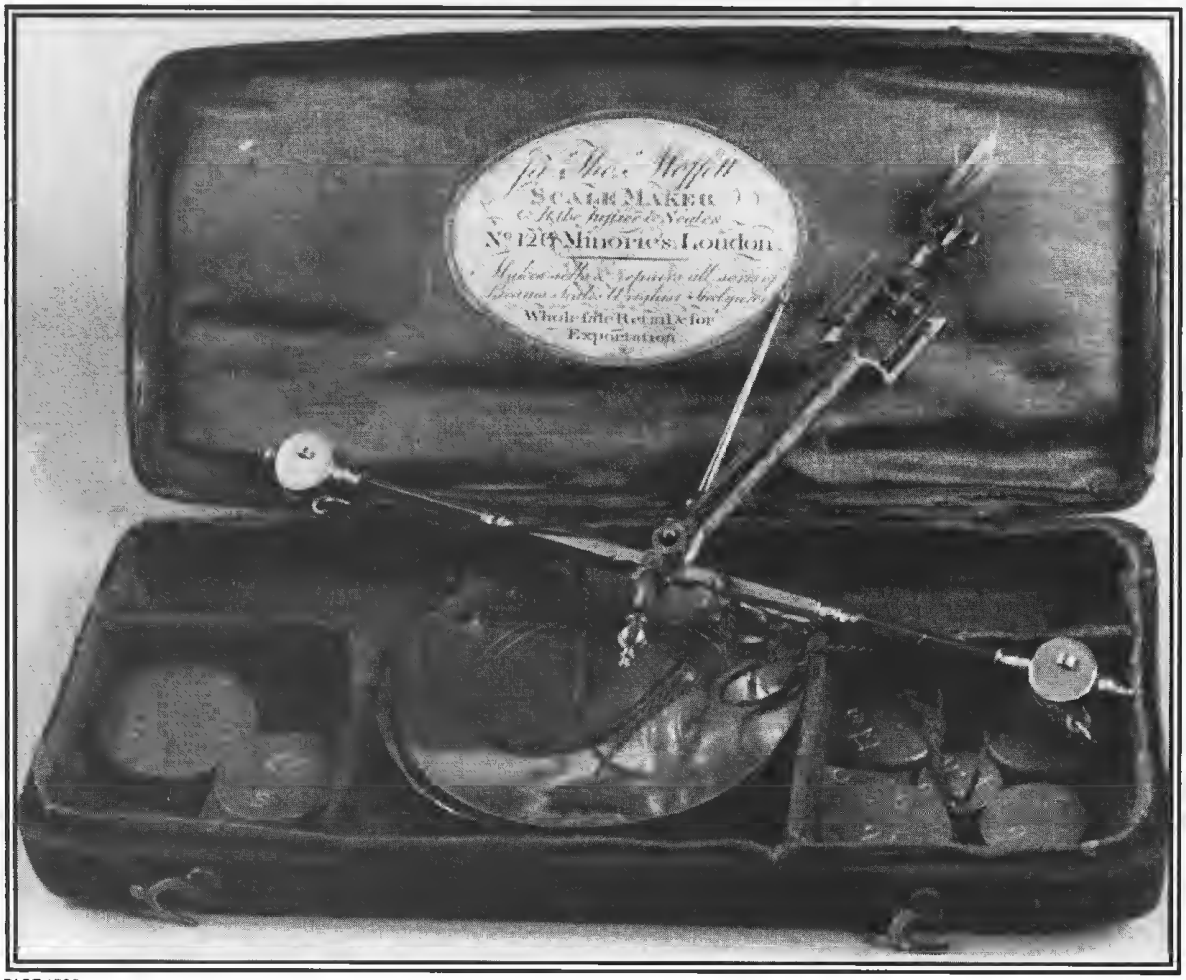
QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

1992—ISSUE NO. 3 PAGES 1581-1608



PAGE 1582

Cover Picture

This coin scale, in a shagreen case, was made before 1800, so its condition is astonishing. The lid and the interior of the box are lined in fresh green silk which has not gone brittle, has not been marked by ink, (a common disfigurement,) and has not been abraded by the bearings of the scale. The label is also undamaged and still adheres to the silk, (commonly the bearings have pierced the paper, and, because the silk is loosely wrapped round the lambs–wool pad, the glue fails to hold the paper.) Obviously the box was never carried in the owner's pocket.

The beam still has the high polish that all coin scales had when they were sold, so that we get a good idea of the vivid beauty of white metal against golden brass, green silk against matt–black shagreen, and the cream silk tassel originally fluffed up ready to be pulled out. The box was old–fashioned, in that it was sold with the eleven weights for Portuguese and English gold coins, each weight a simple brass disc with letters and numbers to indicate the value;– L3 12S; 36S; 27S; 21S; 18S; 13S 6P; 10S 6P; 9S; [6S 9P; 5S 3P;] 4S 6P; and one rarity, the 1/2 F P with a fleur–de–lys, for a French half–pistole. The sheet brass grain weights determined the discrepancy between the ideal weight of the coin and the actual weight, (so that 2 pence could be deducted for each grain of gold lost, and trade could proceed.) *The weights are discussed further in the article 'Introduction to Coin Weights' by George Mallis on pages 1602 to 1607.*

The beam in this box is of superb quality, made at a time when English design was particularly harmonious, with the Adams brothers encouraging country house owners to have clean, fresh lines and colours in their drawing–rooms, Chippendale's book was encouraging the enthusiasm for rather plain, elegant furniture made of unadorned mahogany, and Capability Brown's vision of curving hills with a few trees scattered over them and water flowing round their bases instead of fussy flower gardens, was permeating through to the merchant class. It was a society that was enthusiastic about the quality of the goods and the line of the design; James Thomas Moffett had the good fortune to have the skill to meet the demands of his discriminating customer. *The shears are discussed in the article 'Sight–hole Shears' on pages 1586 to 1590.*

INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

Founded September, 1976

176 West Adams St. • Suite 1706 • Chicago, IL 60603 • Phone 312/263-7500

EQUILIBRIUM is published quarterly in January, April, July and October.

Editor—Diana Crawforth-Hitchins

15 Hawthorn Ave, Headington
Oxford OX3 9JQ, England

ISSN-0893-2883

Mystery of History – the Moffetts

PUZZLING RESEARCH ON THE MOFFETT FAMILY By D F CRAWFORTH-HITCHINS

We can agree, with confidence, that the scale on the cover was made by James Thomas Moffett, but biographical details are a real problem. We know that James Moffett Senior was the son of a brazier in Aldersgate, London and that he was trained by John Swithin. He was given £3.6.8 by Christ's Hospital towards setting up in business in 1756 and worked, at least, until 1783, that he married Elizabeth and he trained his son, James Thomas until James Thomas was freed in 1782. We know that he managed to have almost twice as many apprentices as other scale-makers of his rank, by being a member of both Blacksmiths' and Haberdashers' Company, and taking an apprentice in each Company alternately;– not what the Guilds wanted Masters to do, but not illegal.

Then the problems start. James Thomas Moffett was at 126, The Minories in 1782, when he was freed and when his first apprentice's father was trying to get a grant to pay for his son's binding to 'James Moffett'. By the time the apprentice was actually bound, James Thomas Moffett had moved out to 37, Crooked Lane, Common Street, where he stayed for at least two years. According to Blacksmiths' Company records, that was where they traced him to, when they were trying to get him to join Blacksmiths' Company. So, if he was at Crooked Lane, who was at 126, Minories with Elizabeth in 1783? James Moffett Senior trained no other son, yet Elizabeth Moffett and **Son** worked from 1783 until 1789 at 126, Minories (Fig. 4.) Elizabeth, widow, was authorised by Haberdashers' Company to take one apprentice in 1787 and another in 1789.

From 1789 until 1793 Trade Directories give the name of the firm as **James** Moffett and Son. But who was this James who was old enough to have a son in 1789? James Thomas was only

Fig. 1
Earlier
trade-card.

about 30 years old in 1789, so there is no way that he could have a son of over twenty-one years old, the minimum age to be a trained scale-maker. [And, in case you think that he could get away with putting a child's name on the books, no, the Haberdashers' Company would have hauled James Thomas into Court for such a blatant infringement of the rules.] So, who was running the firm? Three Trade Directories give the name as James Moffett and Son, which suggests that they were being told that name, rather than the Directory compilers' making a mistake. Was James Thomas filling in the forms incorrectly, putting his Christian name first, with the justification that he did most of the work? Who knows?

Fig. 2
This trade card was used firstly by James Thos Moffett, then his Christian name was cut out of the woodcut and Elizabeth's name was inserted. Finally the whole of Elizabeth Moffett's name was removed and Moffett & Blackburn inserted.

The Trade Directories confuse us still further by stating that the firm was owned by **Thomas** Moffett from 1794 until 1798. Was this an abbreviation of James Thomas Moffett's name? This **is** possible, as Haberdashers' Company recorded James Thomas as taking one apprentice, but, when it came to that apprentice's freedom, the master was called Thomas Moffett, so presumably James Thomas was sometimes abbreviated to Thomas. So, we have a possible time when James Thomas was running the firm, and we have to suppose that he ran the firm for a reasonable length of time, as James Thomas had three trade-cards made for him. Usually any one trade-card lasted a maker for about ten years or so, or until he moved premises and was compelled to have a new trade-card. We have an absolute maximum period of seven years in which James Thomas could have needed trade-cards, that is, from 1793 (supposing that he ran the firm when the Trade Directories said that James Moffett and Son ran it,) until 1800, when Elizabeth Moffett was running the firm alone. That implies that James Thomas Moffett was dead by 1800.

Just because he ran the firm for a short time does not mean that he was without responsibility. He presumably took over the training of his mother's two apprentices in 1793, when he assumed responsibility for the firm, and he had already taken five apprentices of his own, four through Haberdashers' and one through Blacksmiths' Company, by turn-over. He took three more before his death, the last one in 1798. We found no record of their being turned over to other masters, so they probably stayed with Moffetts, although not all apprentices' records have survived, and

we have to leave an element of doubt about the apprentices' further training. We can say, though, that 19 apprentices went through training with the Moffetts. Judging by the quality of the beam on the front cover, they got a highly professional training. The knowledge was transmitted for many years, through Richard Vandome, [trained by James Moffett Senior between 1773 and 1781,] and by John Blackburn.

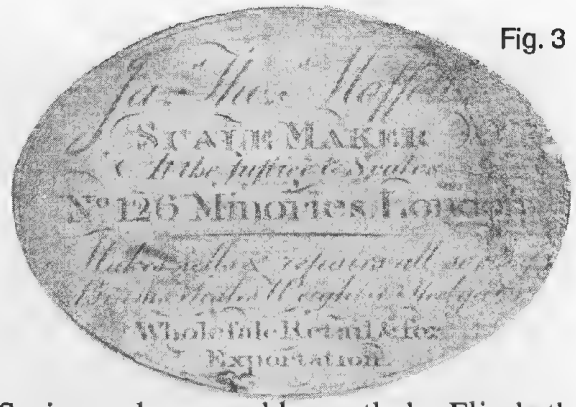


Fig. 3

John Blackburn was partly trained by James Moffett Senior, and presumably, partly by Elizabeth Moffett, until he was freed and started business at 40, White-chapel. He must have married that year, as his elder son, John Blackburn Junior, was bound to him in 1805, as his third apprentice. But he came back to 126, Minories in 1801 to form a partnership with Elizabeth Moffett, and worked with her until 1808, when he became solely responsible for 126 until 1833. We might suppose that Elizabeth was James Moffett Senior's widow, who trained him, but it is just as likely that she was James Thomas Moffett's widow, and had the same name as her mother-in-law.

Now that you have read this, you may ask 'Why does she bother? Why write history with so many suppositions in it.' but this was intentional. The Moffett scale forced me to read the records of all the family, to try to sort them out. This led to the wish to share with you the difficulties of research. It is easy to avoid publishing the 'awkward' families, & to stick to the simple ones, giving you a false impression of records on scale-makers. We need to be aware of the anomalies, discrepancies, gaps & errors that trap historians, to be sympathetic when conclusions are heavily qualified, & be cautious when accepting what historians say!

Fig. 4
1783-
1789.

Sight–hole Shears

By D F CRAWFORTH–HITCHINS

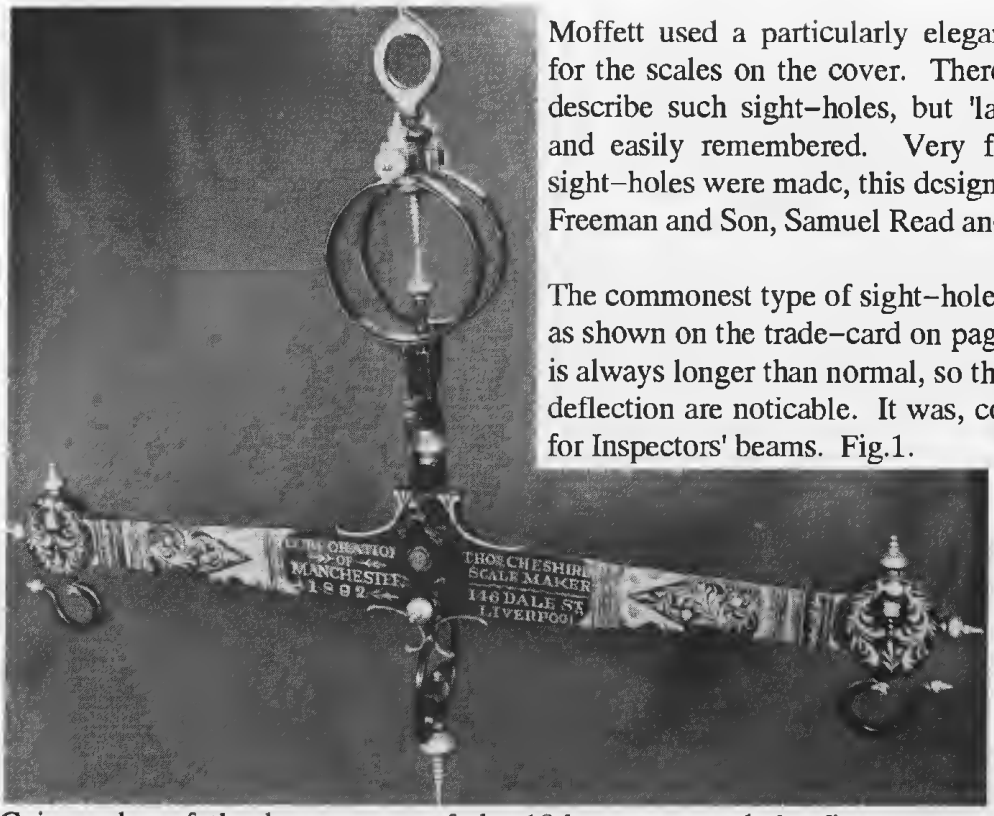


Fig.1. Thomas Cheshire made this Inspectors' beam in 1892, in very old–fashioned style with traditional real gold decoration.

Moffett used a particularly elegant sight–hole shears for the scales on the cover. There is now no word to describe such sight–holes, but 'lantern' is descriptive and easily remembered. Very few of these lantern sight–holes were made, this design being made only by Freeman and Son, Samuel Read and, of course, Moffett.

The commonest type of sight–hole was the plain circle, as shown on the trade–card on page 1583. The pointer is always longer than normal, so that smaller degrees of deflection are noticable. It was, consequently, suitable for Inspectors' beams. Fig.1.

Coin scales of the last quarter of the 18th century and the first quarter of the 19th century occasionally have circular sight–holes, as in Fig. 3. It also occured infrequently on apothecary scales and chemical balances, with the more recent examples having an ivory chart mounted in the rear circle with graduations marked on it. It was even used on 20th century bread scales by Day & Millward, although accuracy was not a goal on such crude devices. R. Watson of Newcastle used an elaborate version of a circle with a mini–circle for his Inspectors' beam. Fig.2.

The other sight–hole that one is likely to see is the tear–drop, as in Fig. 4. This design was used occasionally for coin scales in oval–japanned boxes during the last quarter of the 18th century. It

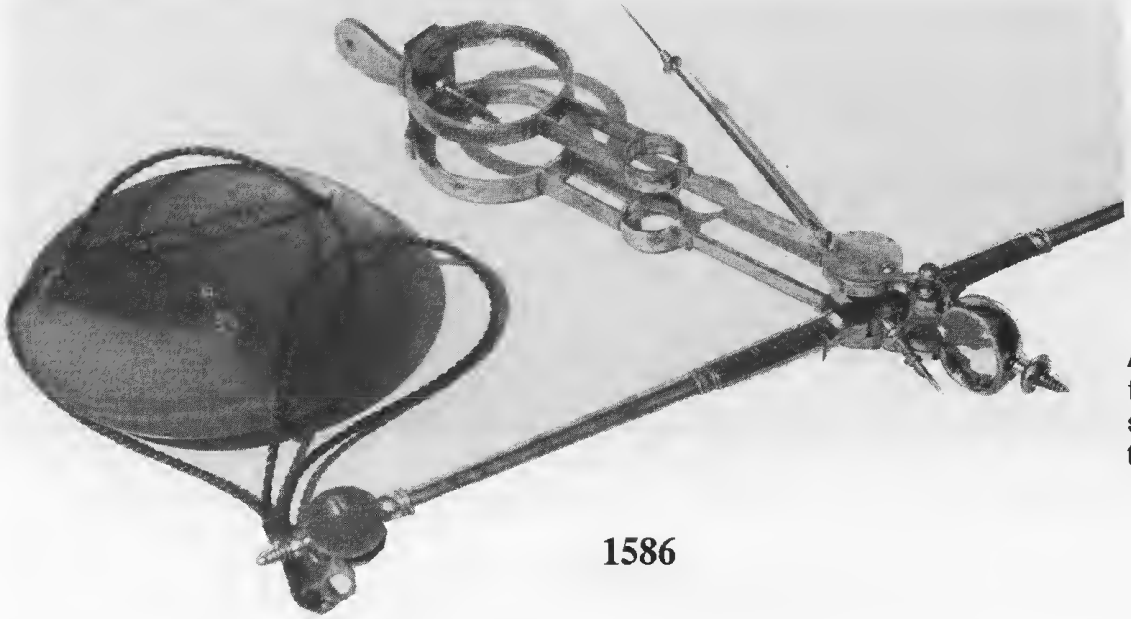


Fig.2 Pan stamped V R 1, for the Board of Trade.

Apologies for the shadows of the sun.

Fig. 3. Box with room for 11 coin weights, made about 1770. Square weights for guinea, half and third made after 1774, and circular Royal Mint weights made in 1821.

was more convenient to make than the true circle, as the iron strip could be bent round and fire-welded to itself, to form a complete side for the shears. The skill was in producing two identical curves on the tear drops that would still look identical when mounted parallel to one another! [On the particular example in Fig 4, the bearings are protected by very unusual collars.]

A modified type of tear-drop is shown in Fig. 5, with a more circular curve and a pinched bottom on the drop. This style is rare, and was made after 1817, when the sovereign was first minted.

Fig.4. Note the unusual pendant.

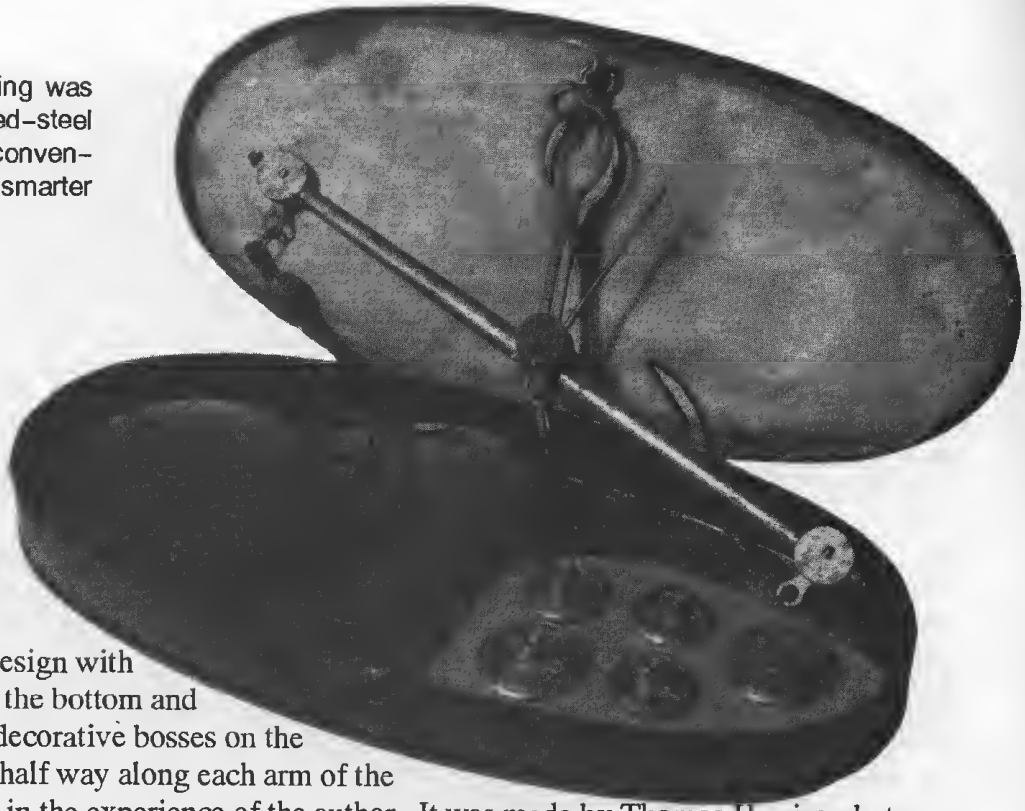


Fig 5. The central bearing was covered with a blued-steel dust-cap, which was conventional on beams in the smarter oval-japanned boxes.

The example shown in Figs. 7 & 8 is a curly design with three lobes, one across the bottom and one at each side, with decorative bosses on the neck of the shears and half way along each arm of the beam, a unique feature in the experience of the author. It was made by Thomas Harrison between 1767, when he probably got his shop number, and 1782, when he stopped scale-making. Harrison shows yet another design of sight-hole on his trade-card, in Fig. 6, which showed his customers what shop-sign to look out for. Was this design ever used for coin scales?

One English scale, of a design never seen before, is shown in Fig. 9. The beam is on a pillar, but the parts can be dismantled and stored in a fitted mahogany box, a feature more commonly used in the 19th century than in the 18th century. The sight-hole shears are, again, unique in the

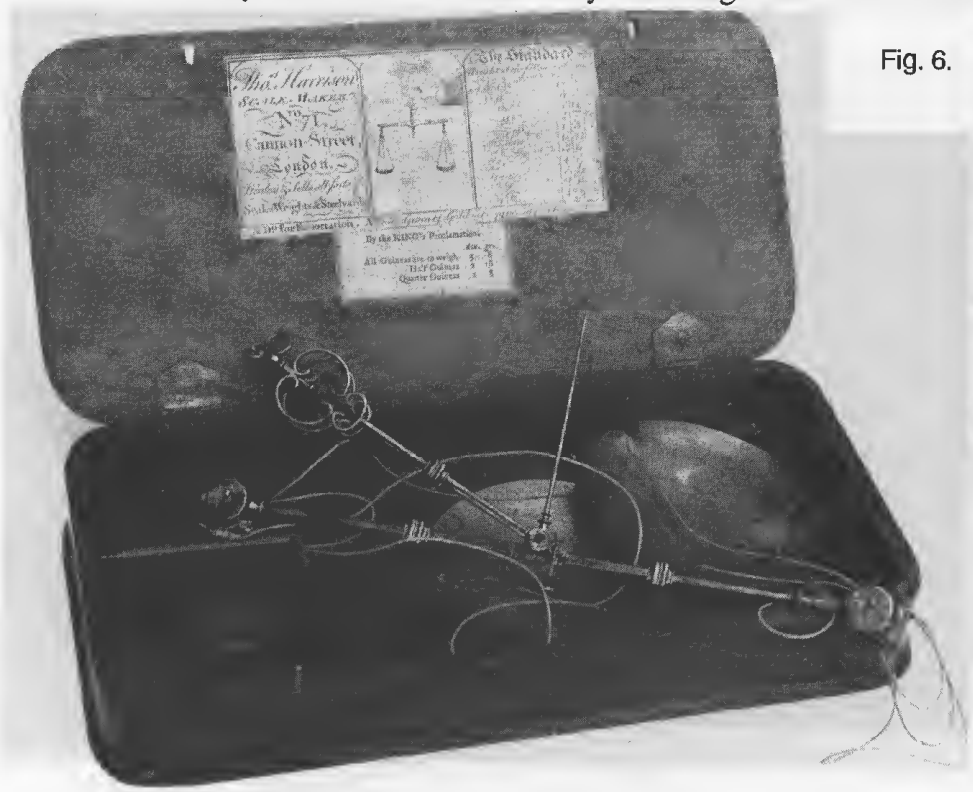


Fig. 6.

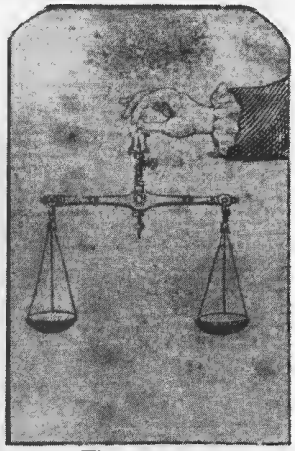
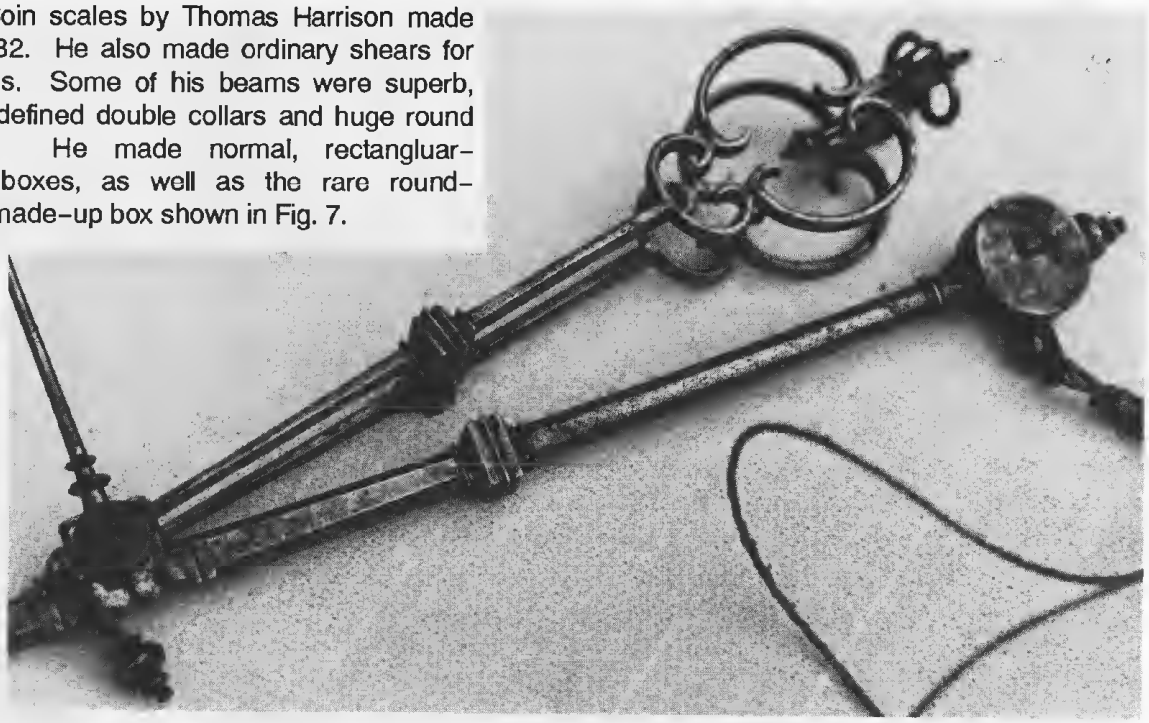


Fig. 7
Note that the owner stuck in the Proclamation of 1774 to remind himself of the new current values.

Fig. 8. Coin scales by Thomas Harrison made before 1782. He also made ordinary shears for coin scales. Some of his beams were superb, with well-defined double collars and huge round box-ends. He made normal, rectangluar-cornered boxes, as well as the rare round-cornered made-up box shown in Fig. 7.



experience of the author, and can be called 'another curly design', which seems a very poor name for such a dainty design. It would be wonderful to know the name of the maker of this scale, and it seems inadequate to label it 'By an Unknown Maker.'

< Fig. 9

Fig. 10

Occasionally coin scales turn up with some rare design that makes it impossible to place. What town was it made in? By whom? The leaf sight-hole on the right is such a scale. The box had a green baize lining, so it must have been made in the 18th century, and the weight pen was quite small, as if made for guinea weights only.Fig. 10

Fig. 11

The sight –hole in Fig 11 is very close in design to that shown on Thomas Harrison's trade card, but it was made about a hundred years after the trade–card was drawn. The beam was painted with roses in the same way as buckets were painted for use on barges and narrow boats. The result is an eye–catching and magnificent trade scale.

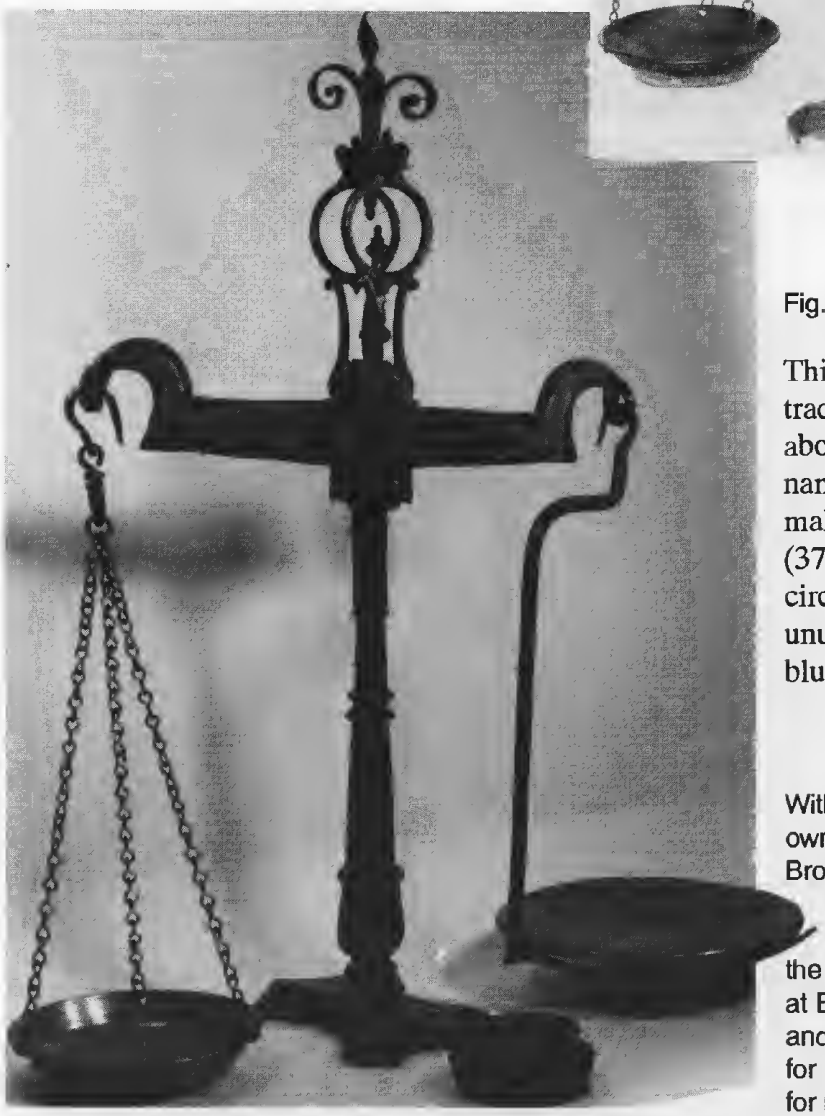


Fig. 12

This trade scale is in the same tradition as the anonymous scale above, but the maker painted his name on this one: 'J Garland', a maker in Birmingham. It has a 15" (37 cm.) beam and an ornamented circular sight–hole. The painter has, unusually, decorated the beam with blue paint, as well as red and gold.

With thanks to the National Trust, owners of Snowshill Manor near Broadway, Dick Chitty, David Bierton, Ipswich Museum, the Royal Scottish Museum in Edinburgh, the North of England Open–air Museum at Beamish, the Castle Museum in York and the British Pharmaceutical Society, for the opportunities that they provided for research and photography.

Chatillon Part 2

By W LINDEYER &
D CRAWFORTH-HITCHINS

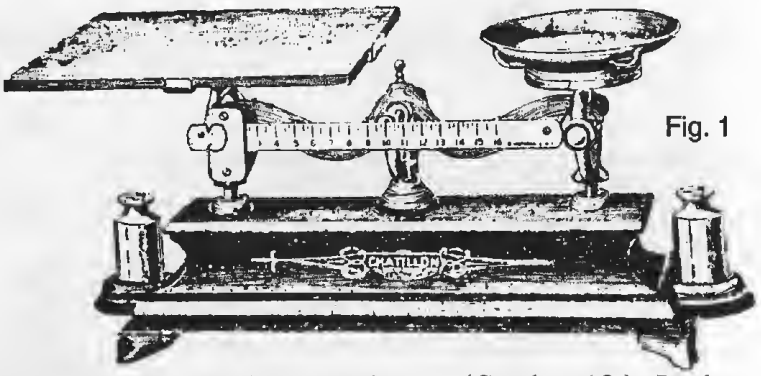


Fig. 1

Chatillon offered a great variety of types of scales in their 1924 catalogue, (Catalog 19.) In the non-spring section they included roberval scales for many special purposes, such as cake weighing, with a 1lb. weight stored on a bulge at each end of the stand and a "tare beam" along the front to increase the capacity of the scale by a further pound. Fig. 1. In Britain, such a scale would have been illegal for trade because the customer would not have been able to differentiate the tare element of the weight from the weight of the article being sold. Such a scale was used in the back of the shop for preparation, but in America, Chatillon offered these scales with 'polished cherry wood and marble base', obviously for use in front of the customer.

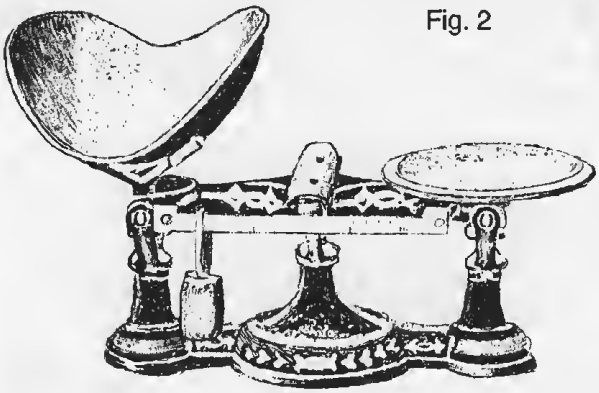


Fig. 2

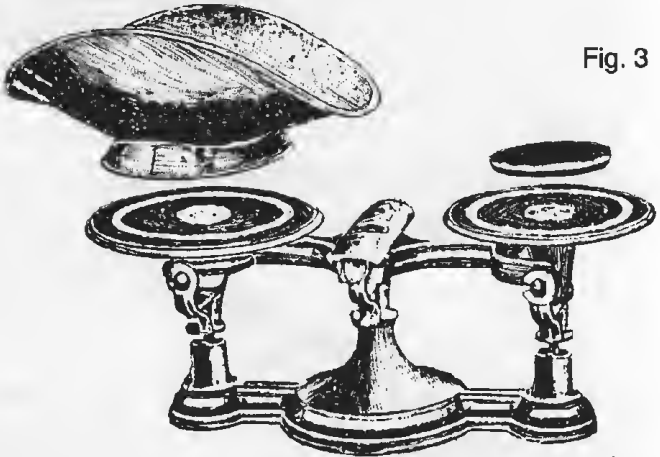
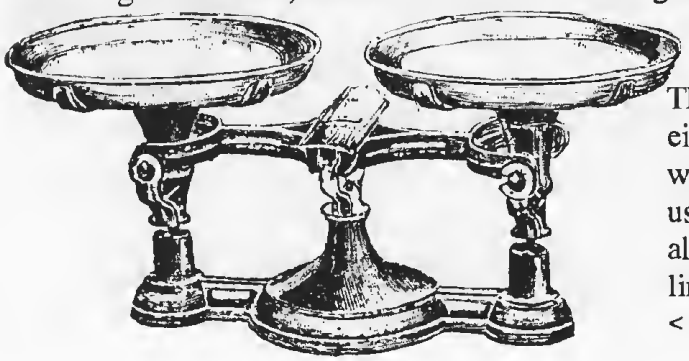


Fig. 3

Chatillon offered little roberval candy scales with rubber tips to protect the scoop from being scratched as it was lifted on and off the scale for every transaction. The casing was prettily decorated with scrolls and leaves, but the weights were only nickel-plated iron. The largest version had an 8 lb. capacity which seems to indicate some very greedy candy addicts! Fig. 2.

They sold a grocers' trip scale with two plates attached to the roberval linkage, and a loose scoop for one side and a balance weight for the other side. Fig. 3. Again, this scale would not have been legal in Britain, because of the risk that the grocer would 'forget' to use the loose balance weight, & use extra ordinary weights.



Their butchers' trip scale was available with either a porcelain plate or a marble plate, but I would not have liked to buy from a butcher using such scales, as the linkage was exposed to all the bloody drips and splashes. Fig. 4. The linkage parts were extremely difficult to clean.

< Fig. 4

Chatillon made very practical "nests" of flat weights, with good large rims that made them easy to pick up. Only the largest 8 lb weight would have caused problems because of its large diameter, which would have required a hand as big as an orangutang's to pick it up without danger to the feet. Fig. 7. They offered no metric weights, as the minute demand in America was supplied by specialists like Henry Troemner.

Their ultra-modern grocery scale that was "attractively finished in white enamel," Fig. 5, still left all the roberval linkage exposed, with the three brass beams and their sliding weights also exposed to the sugar, flour etc so "conveniently" weighed on this scale. The rear beam was for taring the container and was not calibrated., the middle beam was for 10 lb and the front beam for 16 oz, with two proportional 10 lb weights to go on the end of the beams on a hanger. A pointer was fitted below the beams, with a sloping chart to indicate when the scale was in balance.

They boasted of the steel bearings on their Union scale, which leaves us wondering what the bearings were made of on their other counter steelyards.

Chatillon's Portable Platform Scales went up to 1500 lb capacity, but were not adjusted with as great a degree of accuracy as their English counterparts. In England, they had to be accurate to half a division, but in America they were within the law if they were accurate to two divisions on the steelyard. This gave local makers an advantage in Britain, as they could claim that their scales met the requirements of the British Inspectors of Weights and Measures, whereas the American imports did not necessarily do so.

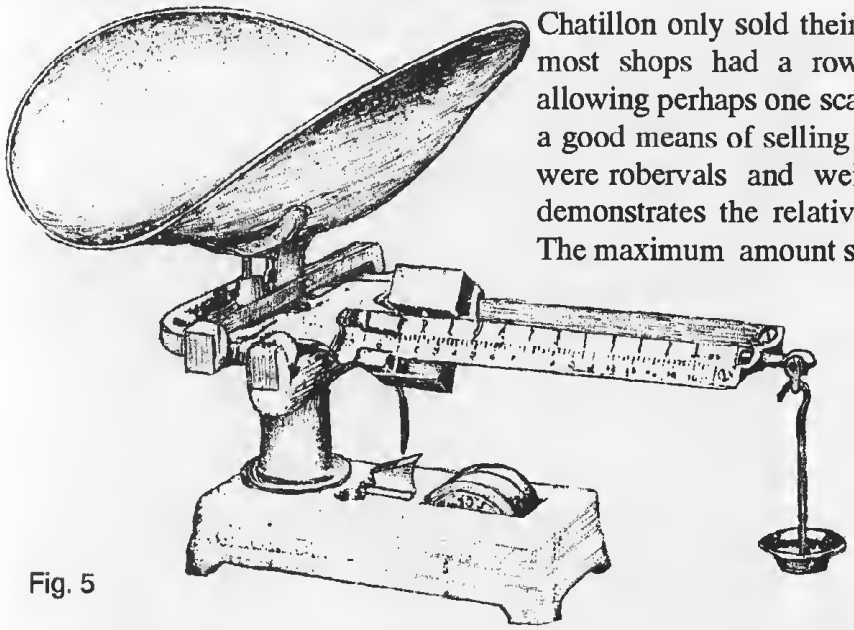


Fig. 5

Chatillon only sold their tea scales three in a box, but as most shops had a row of scales along their counter allowing perhaps one scale to each two assistants, this was a good means of selling scales in bulk. Fig.6 The scales were robervals and weighed up to 4 lb of tea, which demonstrates the relatively low cost of tea in America. The maximum amount sold in Britain was normally 8 oz, and it was frequently sold in much smaller quantities, because high taxes made it extremely expensive for working people. Fig. 6.

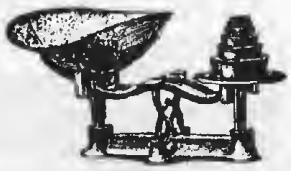
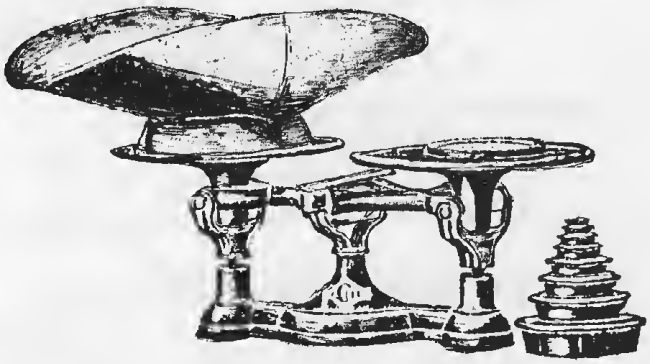


Fig. 6

The Bakers' Dough Scales were available as sturdy robervals, or as equal arm balances to hang above the work surface in the bakery. An 8 lb stack of flat weights came with the roberval, implying large loaves and big families. Fig. 7.

Chatillon sold 33 sizes of equal arm beam for trade use, without specifying the trade. They ranged from 14 inch beams to 4 1/2 feet beams, but the degree of sensitivity was not given. In

Fig. 7



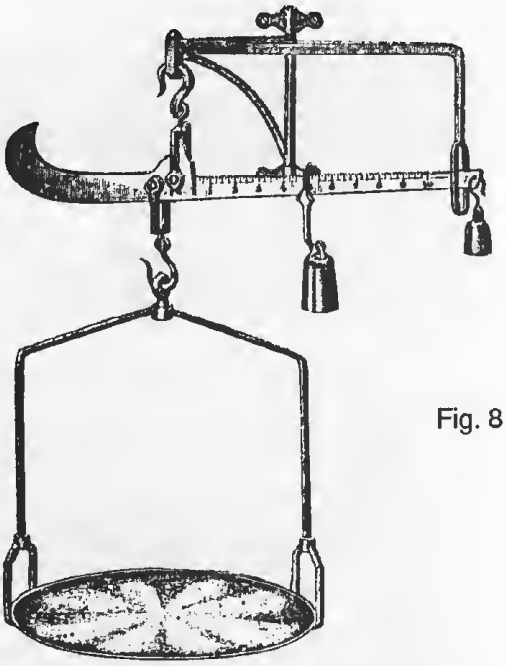


Fig. 8

Britain, on a 7 lb. capacity beam, for example, the maker stated "Class A" (sensitive to 0.5 of a grain [0.032 grams] when fully loaded, with a greatest error of one grain [0.065 grams] either in excess or deficiency when fully loaded,) "Class B" (sensitive to 4 grains [0.13 grams] when fully loaded, with a greatest error allowed either in excess or deficiency when fully loaded of 6 grains [0.39 grams]) or "Class C" (sensitive to 12 grains [0.78 grams] when fully loaded, with a greatest error allowed in excess or deficiency when fully loaded of 18 grains [1.17 grams]) so that the trader could order an appropriate scale.

Chatillon supplied "Boston Market Beams", in other words, brass steelyards with a turned up end, loose weights to raise the capacity, and a wall mounting crane. Fig. 8. Although brass steelyards were rare in Britain, they were used quite extensively in America, and ranged in capacity from 50 lbs to 125 lbs. There is no reference to any hardened edge to reduce wear along the notches, so we must presume that the beam rapidly lost its accuracy.

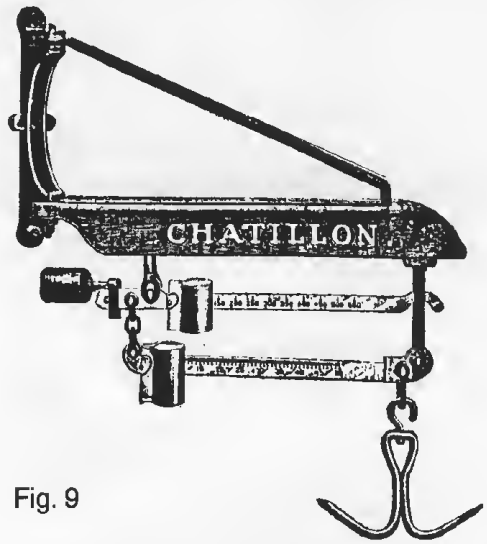


Fig. 9

The Chatillon Butcher's Meat Beams were more precise, with two steelyards and no loose weights. Fig. 9. They were larger, with a capacity of 600 lbs, so would have been used to weigh half a steer, rather than a pound of mince.

They also sold turn-over steelyards with two poises, one for the light side and one for the heavy side. For example, a 200 lb "beam" needed a 1 lb poise for the light side and a 4 lb poise for the heavy side, while a 3000 lb "beam" needed a 32 lb poise for the light side and a 64 lb. poise for the heavy side. Again, the customer would need to have his wits about him, to prevent any fraud being perpetrated. Chatillon made the poises in common iron, best iron, brass and in Foreign Standards.

All this makes it sound as if Chatillon sold a lot of robervals, steelyards and equal-arm beams, but really they had settled down to make themselves the market leaders in spring balances. They

made all the common varieties of spring balances, and stated that they could make special ones ranging in capacity from one hundredth part of an ounce to one ton. Their flat–faced spring balances included brass or nickel–plated versions for letters, straight ones with hooks, tin pans, square flat pans, tin scoops, thicker brass, for educational use or general purposes.

Their tubular spring balances ranged from the delicate to the ultra–robust, from sportsman's balances patented in 1912, through black–japanned steel tubes of 1000lb capacity, wagon scales

CATALOGUE OF CHATILLON SPRING BALANCES COMPILED BY W. LINDEYER

Legend: CHATILLON'S
IMPROVED
SPRING BALANCE
NEW YORK
PAT. DEC 10th 1867
12 x 1/4
25 x 1/2
30 x 1/2
40 x 1/2
50 x 1

Legend: CHATILLON'S
BALANCE NO 2
PAT'D DEC 10th
1867
12 x 1/4
25 x 1/2
30 x 1/4
40 x 1/4
50 x 1

Legend: CHATILLON'S
BALANCE NO 2
NEW YORK
PAT'D JAN. 6 1891
JAN. 26 1892

Also with: NOT
LEGAL FOR
USE IN
TRADE
25 x 1/2
25 x 1

Legend: CHATILLON'S
BALANCE NO 2
NEW YORK
25 x 1/2

Legend: CHATILLON'S
IMPROVED SPRING BALANCE
WARRANTED
25 x 1/2

Legend: CHATILLON'S
IMPROVED
SPRING BALANCE
NEW YORK
25 x 1/2
30 x 1
50 x 1
80 x 1
100 x 1
125 x 1
150 x 1
200 x 2
250 x 2
300 x 2
400 x 4

Legend: CHATILLON'S
LETTER
BALANCE
N Y
4 oz.
8 oz.
4

Legend: CHATILLON'S
IMPROVED
PACKAGE SCALE
PATENTED
4 x 1 (64 oz. x 1 oz.)

Legend: BALANCE
MADE BY
CHATILLON
PATTENTED
8 x 1/2 oz
8 x 1/2 oz (250 x 10 g)
64 x 1 oz.
64 x 1 oz (2000 x 25 g)

Legend: CHATILLON
MADE IN U.S.A.
25 x 1/2

Legend: JOHN
CHATILLON
& SONS
MAKERS
NEW YORK U.S.A.
NOT LEGAL
FOR USE
IN TRADE
50 x 1

Legend: CHATILLON
NEW YORK
U.S.A.
8 x 1/4 oz (250 x 10 g)

Legend: TYPE 100
CHATILLON
NEW YORK U.S.A.
CAPACITY
lbs x
CATL 90
100 x 1

Legend: CHATILLON'S
IMPROVED CIRCULAR
SPRING BALANCE
TO WEIGH lb
15 x 1/2 oz.
30 x 1 oz.
60 x 2 oz.
120 x 4 oz.
200 x 1
240 x 4 oz.
400 x 1

Legend: CHATILLON'S
IMPROVED CIRCULAR
SPRING BALANCE
TO WEIGH lb
MILK SCALE
30 x 1 oz.
30 x 1/10
60 x 2 oz.
60 x 1/10
120 x 4 oz.
120 x 1/5

Legend: CHATILLON'S
IMPROVED CIRCULAR
SPRING BALANCE
WARRANTED
15 x 1/2 oz.
30 x 1 oz.
60 x 2 oz.
120 x 4 oz.

Legend: CHATILLON'S
FAMILY SCALE
5 x 1/4 oz.
10 x 1/2 oz.
16 x 1/2 oz.
20 x 1
40 x 2

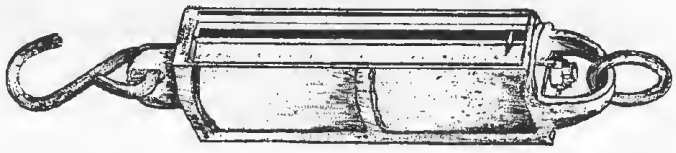


Fig. 10.
Extra heavy duty. 300 lb. x 2 oz.

Legend: CHATILLON
(Sportsman's balance)
4 x 1 oz.
6 x 2 oz
6 x 1/4 oz
8 x 1/4 oz.
10 x 1/4 oz
15 x 1/4 oz.
20 x 1/4 oz.
20 x 1/2 oz.
25 x 1/4 oz.
30 x 1/4 oz.
30 x 1/2 oz.
40 x 1/2 oz.
50 x 1/2 oz.
60 x 1/2 oz.

Legend: C
(Sportsman's balance)
15

Legend: CHATILLON
(Wagon scale)
25 x 1/4
50 x 1/2

Legend: CHATILLON
(Leather Inspection)
50

Legend: CHATILLON'S
IRON CLAD
ICE BALANCE
PATENTED
DEC 10 1867
120 x 2
160 x 2
200 x 2
200 x 5
300 x 5
400 x 5
500 x 5

Legend: CHATILLON
VULCAN
200 x 2
300 x 5
400 x 5
500 x 5

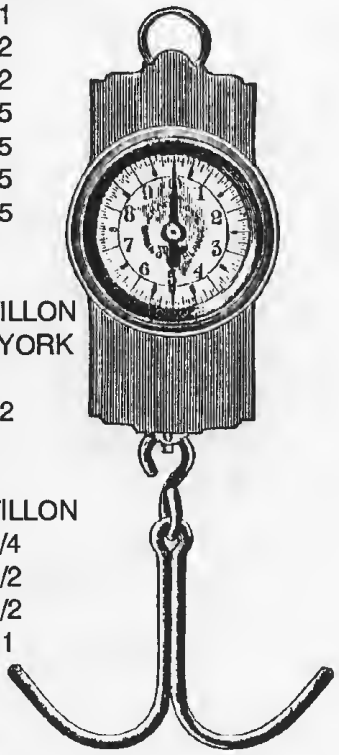
Wagon scale.

Hide scale.

Legend: CHATILLON
IRON CLAD
100 x 1
160 x 2
200 x 2
200 x 5
300 x 5
400 x 5
500 x 5

Legend: CHATILLON
NEW YORK
(Utility scale)
300 x 2

Legend: CHATILLON
12 x 1/4
25 x 1/2
50 x 1/2
100 x 1



Note that **both** the scales on the right were made under the patents of Jan 6 1891 and Jan 26 1892, but Fig. 12 is called a Family Scale, number 8572, and Fig. 13 is a '3 in a Star' (3 Star?.)

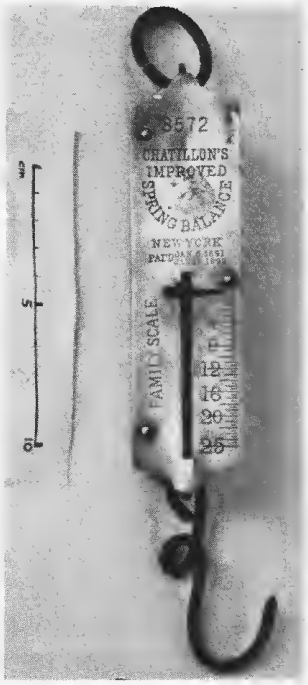


Fig. 11 Fig. 12 Fig. 13

approved by Sealers of Weights and Measures for use on laundry wagons etc, Vulcan ice balances (Fig. 11) which must have worried those Sealers because of its adjustable cap which facilitated fraud, the Utility scale with its rugged frame protecting the tube (Fig. 10,) and the leather inspectors' scale with its enormous cradle for hides.

CHATILLON 1924 CATALOGUE ANALYSIS OF VARIATIONS;–

Flat face	**68**
Tubular	**53**
Slide and dial, round	**203**
" " " , rectangular	**162**
" " " , with damper	**32**
" " " , 1/2 rectangular & round	**30**
" " " , with tare pointer	**162**
Dial	**106**
Top pan, spring and 1/2 roberval	**76**
Top pan, with external legs	**3**
Dial and platform	**44**
Dial and 1/2 roberval	**33**
Roberval	**119**
Equal arm	**36**
Steelyards	**40**
Steelyard and 1/2 roberval	**11**
Total	**986 varieties**

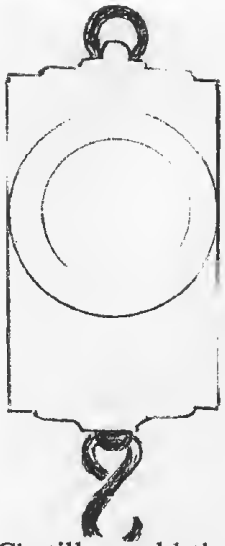


Fig. 14
Rectangular

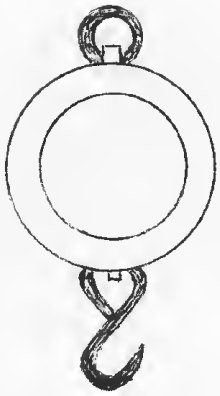


Fig. 15
Round

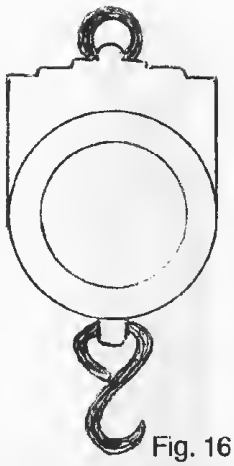


Fig. 16
Half–rectangular & round

Chatillon sold their flat–faced and tubular balances in boxes of half or a quarter of a dozen, as cheap balances made a profit only if sold in enormous numbers. They sold only 121 varieties of flat–faced and tubular spring balance, (12% of their total number of varieties) but probably made *more* of the little balances than any other type. Certainly, judging by the numbers surviving, they made millions of the simplest spring balances.

But the 1924 catalogue superficially presents a very different story. See the Table on page 1597. Nearly half of all the varieties offered were slide–and–dial scales, called 'Circular Spring Balances', sold singly. These scales were being made by George Salter in England by 1830, and, judging by the drawings, Chatillon made an exact copy of the Salter. By 1924, Chatillon were making three variations on the theme; which are called, for convenience in discussing them, the Rectangular, (Fig. 14,) the Round, (Fig. 15,) and the Half–rectangular and Round, (Fig. 16,) but all were technically Circular Spring Balances. The slide was pulled down by the load, and the pointer, turned by the rack in the concealed part of the slide, went round its dial three times. Each complete turn on the dial was registered by a mark on the slide, and parts of a turn were read off on the dial. For example, if the capacity of the scale was 60lb, the dial was divided into 20lb, in units of 1lb or 2lb, and the slide was marked at 20lb and 40lb. So, if the load weighed 56lb, the user read off 40lb on the slide and added on the 16lb recorded on the dial. Fig. 17.

Fig. 17.

The advantage of these slide–and–dial combinations was the very large divisions on the dial, and the ease with which the trader could read them. The scale was very compact, having two or more strong springs side by side inside the casing, so compact that it could be hung up in a more confined space than an equal–arm scale of equal capacity. No loose weights were needed which could be lost in the hurly–burly of trade. It cost

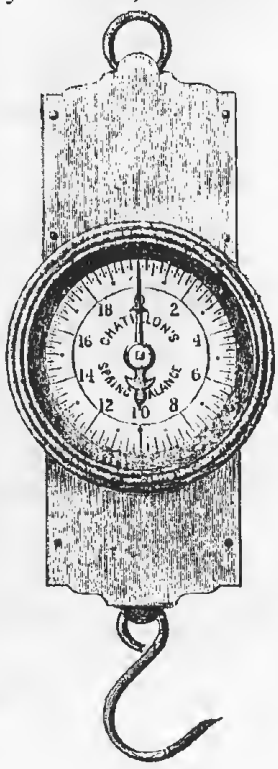


Fig. 18.

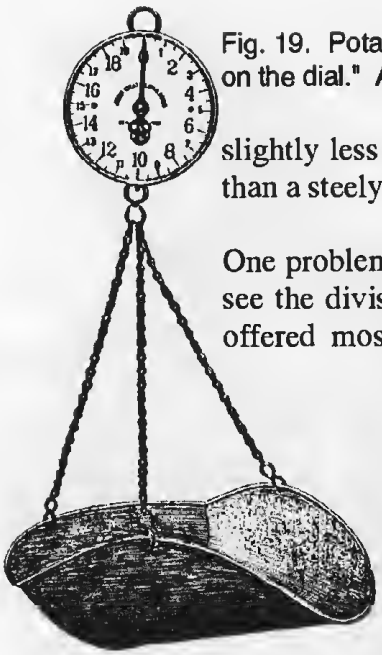


Fig. 19. Potato Measuring Scale. "The values of 1 Qt, 2 Qts, 4 Qts & 1 Peck are shown on the dial." A quart and a peck are measures of volume, not weight units!

slightly less than an equal–arm beam with its chains, pans and weights, and less than a steelyard of the same capacity.

One problem found by the users of the slide–and–dial was that it was difficult to see the divisions and the numbers on a brass face, in a poor light. So Chatillon offered most versions with the choice of either a brass face or with a white face. The white face was usually protected by glass, called a sash in the catalogue. (Fig. 18.) Then the user got the advantage of clear numerals, but the disadvantage of a more breakable scale.

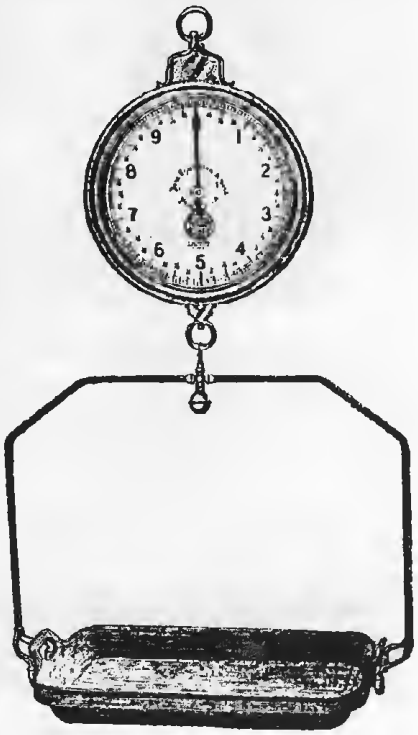


Fig.20 >

From 1904, for impatient users, Chatillon offered a damper on the pointer,'*With Patented Device for Preventing the Vibration of the Pointer, Making it Stop Instantly at the Correct Weight'*. (Fig. 20.) In 1924 they were still calling it their 'Latest Design in Scales for Market Use'. No improvements for 20 years! Either the design was so good that it needed no changes, or they had a complacent design team.

They did try out one variation – their 'Gold Circle' – that revolved only 1 1/2 times. This meant that a greater proportion of the divisions had to be crammed onto the dial, giving the user no advantage. It appears to be modernisation of the sake of modernisation.

Fig. 21

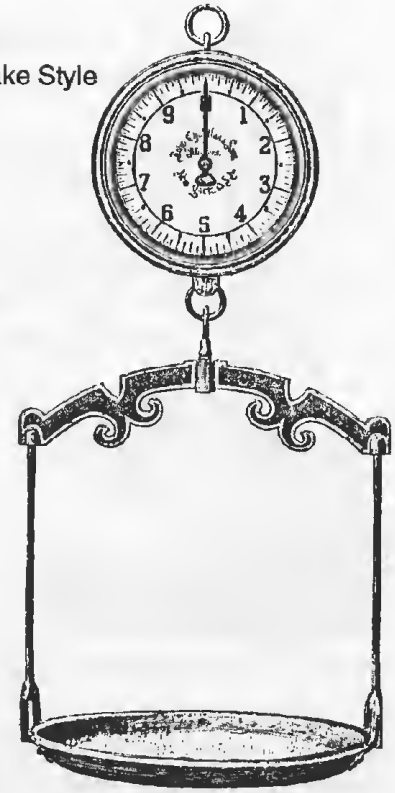
The milk scale needed to be adjusted to allow for the weight of the bucket, so an empty bucket was hung on the scale first, then "the loose Pointer, which by means of a thumb screw on the centre of the Pointer, may be set anywhere on the Dial, thus taking the tare of a Milk Pail etc". (Fig. 21.) That bucket was removed and the full bucket put on the scale. Presumably, these scales were used only on the farm for checking the quantity of milk given by each cow. If milk was sold using such a scale, fraud would be all too easy, by setting the tare with a light bucket and selling the milk from a heavy bucket.

To confuse their customers, Chatillon called their dial scales 'Circular Spring Balances', but the pointer went round only once, showing the total capacity of the scale on the one dial. (Fig. 19.) There was no graduated slide. Ten per cent of their varieties were dial scales, and they have no features that need discussing.

Fig. 23 A. The face of the top-pan baby scale.

Fig. 23 B. Top-pan baby scale

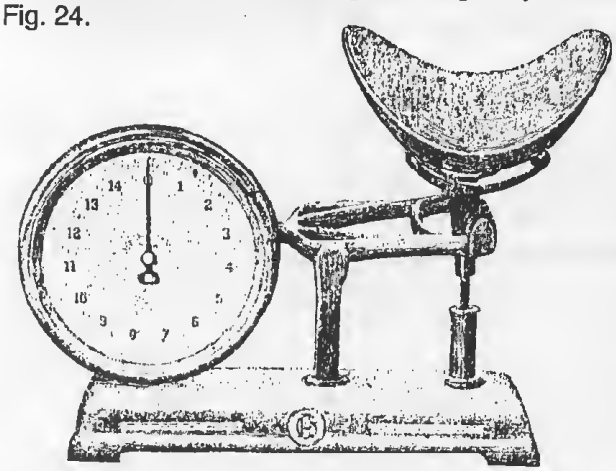
Fig. 22. East Lake Style



They made dial scales attached to platforms for counter scales, for floor use and for weighing people. They were never popular in either the U. S. or Britain, and very few have survived.

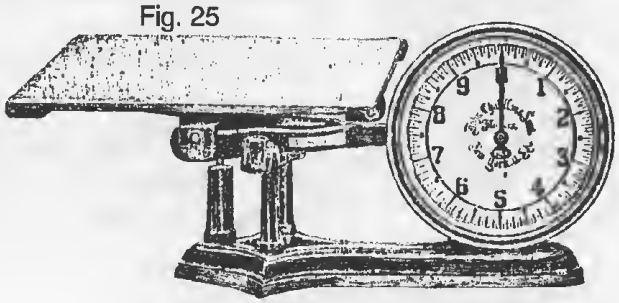
Their only other dial scale, also rare now, was the type attached to external half roberval linkages, to allow the load pan to be above the dial. Fig. 24 and Fig. 25. Although they look so rugged, they did not have the strength or capacity of the next variation.

Fig. 24.



The top pan spring scale had a straight spring attached to a much larger half roberval linkage, hidden within the box. (Figs. 23, 26 & 27.) Chatillon was only one of many American companies who specialised in top pan scales for trade, household and postal use. They were cheap, easy to clean and made in enormous numbers. Any European seeing one of these black-boxed top-pan scales, thinks of America, and Europeans expect to see numerous examples in any American collection.

Fig. 25



Chatillon's least common type was their spring dial scales with external legs, (Fig. 28,) which look interesting but were not practical because of the friction between the legs & the guide-holes. They only had 3 varieties, and probably any owner went out for a more efficient one as soon

Fig. 26

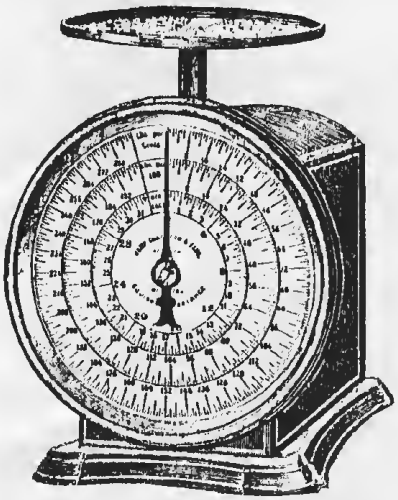


Fig. 27

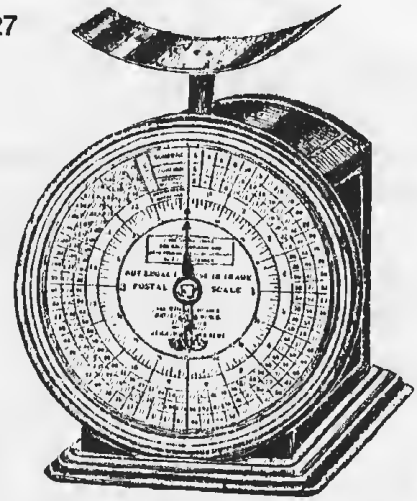
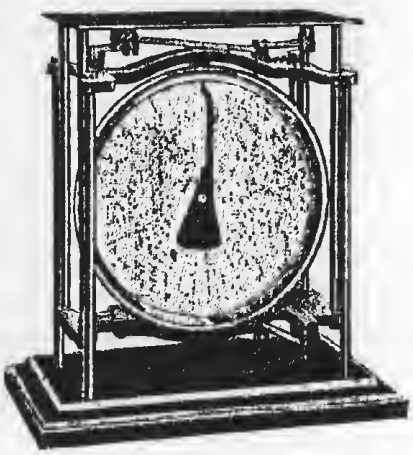


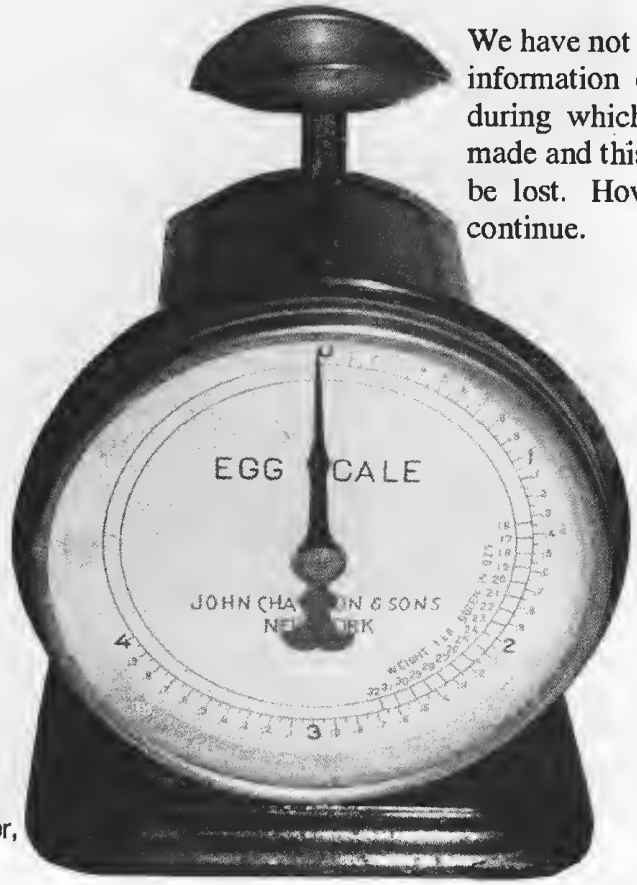
Fig. 28



he could afford to, no doubt cursing the salesman who persuaded him to buy such an inadequate scale in the first place. Did he buy Chatillon next time?

Chatillon did not want their customers going elsewhere for their non–spring balances, so they offered a useful range of alternatives, discussed at the beginning of this article. Twenty per cent of their variations were robervals, equal arm scales, steelyards or steelyards with half roberval linkages, placed at the end of the catalogue, after the twine boxes & candy hatchets.

We have not been able to find any information on the time periods during which particular scales were made and this information may well be lost. However the search will continue.



With thanks for additional material to J Katz, B Fogler, E Cohn, B Doniger and J Malter.

Introduction to Coin Weights

By G. MALLIS

Webster's Dictionary and the American Numismatic Association agree that "numismatics" is the study and/or collection of coins, tokens and related objects. However, it is strange that the classification and collecting of coin weights has yet to be included in this study. Coin weights are an integral part of numismatics, yet only a handful of articles and books on the subject can be found on the shelves of some of the best-known libraries in the United States or abroad.

Numismatic scholars and archaeologists generally agree that the first coinage was produced in 650 B.C. in Lydia by King Ardys. His coinage consisted of lumps of electron (a natural deposit containing varying amounts of gold and silver) that were heated and then put on a plate and hammered with a punch – crude, but much more advanced than the barter system then widely used in everyday society. From this early beginning, coinage as we know it came into being.

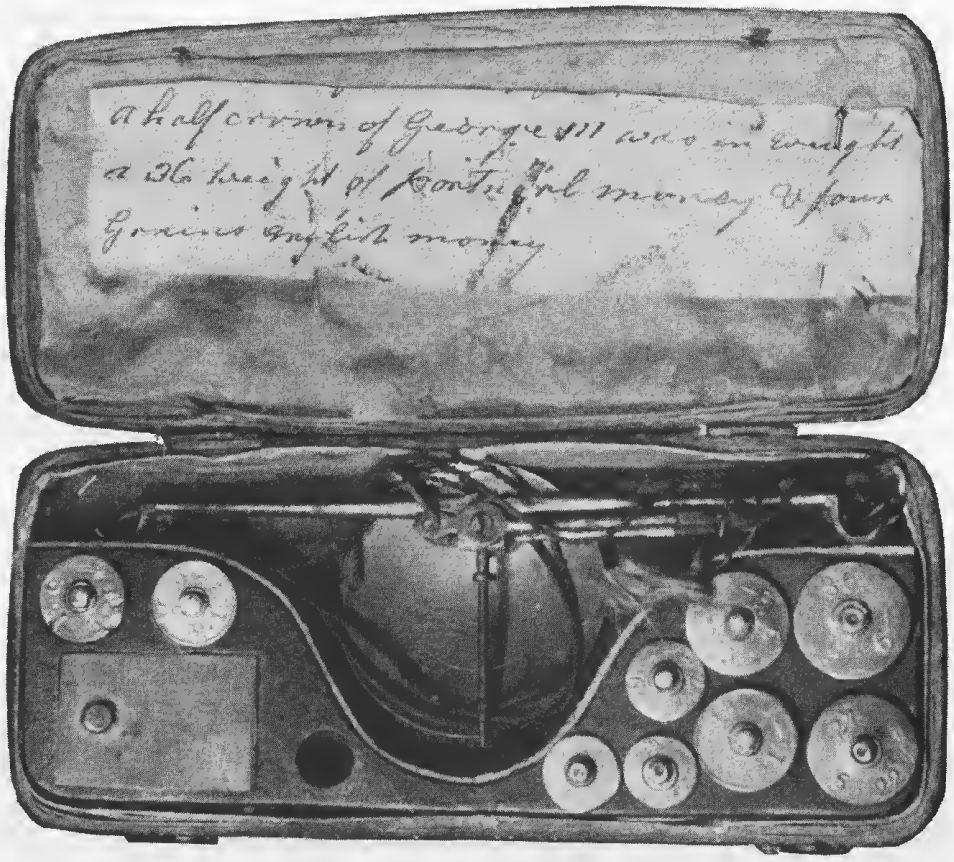


Fig. 1. An English shagreen-cased coin scale made between 1762 and 1774, the weights having knobs for ease of removal. Note the owner's handwritten label "A half crown of George III was in weights a 36 weight of Portugal money & four grains English money", a clever and ingenious use of coin weights.

A natural development was the subsequent creation of a method by which to verify a coin's weight. Remember, prior to the introduction of fiat money or plastic credit cards, the value of each gold or silver piece was based on the intrinsic value of the metal in the coin. Thus, the use of standard coin weights to ensure a coin's full weight and value became a necessity. (It is a standing joke among numismatists that, if King Ardys struck the first coin at 8 o'clock in the morning, the first counterfeit coin likely appeared at 8:05.)

Fig. 2, Stone half-shekel weight

Fig. 3, Glass half-dirhem weight

Fig. 4 This round coin weight was used in Vatican City during the papacy of Innocent XI, (1676–1689.)

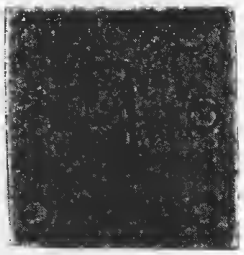


Fig. 5. This coin weight, used under Spain's King Ferdinand and Queen Isabella in Spanish Flanders, represented a half–royal of Portugal. The seven circles on the reverse indicate '7 penny weight', the numeral '7' was added later.

Such weights were provided by the government or produced under government supervision or control. The earliest known coin weight, reportedly, is a bronze example from ancient Rome (circa 55 B.C.) Coin weights proliferated until the early part of the 20th century, when their use was no longer required.

The physical composition of coin weights varies, from the iron and lead weights of the early Hebrews (Fig. 2,) Greeks and Romans, to the glass weights of the early Islamic nations (Fig. 3,) and on to the more sophisticated bronze, brass, copper and silver weights of Western Europe. It was found that weights composed of lead were too soft and became unreliable after a very short period of use. Iron weights were subject to rust and, too, were not reliable for any extended time. Glass weights were very fragile. Copper was a better material, but was soft and subject to wear.

Fig.6. This roughly cut 'cob' weight from the late 16th or early 17th century, was used to weigh Spanish coin.

Fig. 7. The face of this 'monetiform coin weight shows the obverse of Holland's gold half–rider of 1606.

Bronze, and later brass, became the standard metals of use. The vast majority of coin weights available today are brass and are well within the means of the average collector. Silver coin weights were produced for nobility in limited quantities and, needless to say, when found, command very high prices today.

The shapes of coin weights differ greatly, depending on the era during which they were produced. Some early weights from Western Europe are octagonal, hexagonal or triangular. However, generally speaking, most weights are either round or square. Round coin weights are reasonably circular with fairly constant radii (Fig. 4.) Square weights, on the other hand, can be geometrically square, slightly rectangular or trapezoidal, and the edges may be bevelled (Fig. 5.) When weights are rough cut from pieces of metal, they are known as "cob" weights (Fig. 6.) Many weights are fitted with a small knob on the top to allow easy withdrawal from scale boxes (Fig 1.)

Fig. 8. Guinea weight with bust of King George III, as a young man. Verified by Royal Mint.

TYPICAL OBVERSE	TYPICAL REVERSE
1. Portrait of ruler	Blank
2. Monetiform	Monetiform
3. Value in letters ("ONE SHILLING")	Value in letters ("ONE SHILLING")
4. Value in numbers ("5:3" or "XX")	Value in numbers ("5:3" or "XX")
5. Value in letters and numbers ("20s SOVEREIGN")	Value in letters and numbers ("20s SOVEREIGN")
6. Weight in letters and numbers ("2 dwt. 8 gr.")	Weight in letters ("TWO DWT. EIGHT GR.")
7. Weight in numbers ("2.8")	Weight in numbers ("2.8")
8. Weight in letters and numbers ("2 dwt. 8 gr." or "2D 8G")	Weight in letters and numbers ("2DWT. 8GR.")
9. Ruler on horseback or aboard ship	Ruler on horseback or aboard ship
10. Royal cypher (crown) over G III (or G III alone)	Royal cypher (crown) over G III
11. Weight in numbers, value in letters ("2.14 / HALF A GUINEA")	Weight in numbers, value in letters ("2.14 / HALF A GUINEA")
12. Weight and value in numbers ("2.14 / 10..6")	Weight and value in numbers ("2.14 / 10..6")
13. Weight and value in letters ("TWO D.FOURTEEN G. / HALF A GUINEA")	Weight and value in letters ("TWO D.FOURTEEN G. / HALF A GUINEA")
14. Weight in letters and numbers, value in letters ("2 DWT.14 GR./ HALF A GUINEA")	Weight in letters and numbers, value in letters ("2 DWT. 14 GR. / HALF A GUINEA")

Weights frequently carry a portrait of the ruler, as well as the denomination or value. Fig. 8. "Monetiform" weights feature all or part of the designs of the coins whose weights they represent (Fig. 7, 20 and 21.) Numerals may be Arabic or Roman. The table above lists some of the weights most commonly encountered in Britain.

In the case of the governments of Western Europe, coin weights were issued by several mints, but most coin weights were made by commercial weight makers. To protect the public from fraudulent weights, governments empowered cities, towns or other qualified entities to periodically check the accuracy of coin weights.

Fig. 9. Guinea weight with Royal Mint verification

Fig. 10. Guinea weight with Founders' Co. verification.

In England, for example, the Royal Mint was authorised to examine coin weights when they were made,and if found to be correct, were counterstamped with a crown (Fig.9.) Similarly, the City of London used the Worshipful Company of Founders to check the accuracy of coin weights made in and around London (Fig. 10.) The guild counterstamped approved weights with its mark, a ewer (water pitcher.) In France, a fleur–de–lis was stamped on weights

< Fig. 11. The Banker, drawing by Corneille, from a painting by Marius van Reymerswael.

Fig. 12. Banker's nesting weights for 128 Reals of Eight.
Fig. 13. Banker's nesting weights for 128 Crowns.
Fig. 14. Banker's nesting weights for 32 Hungarian Ducats

used in Paris and other areas of the country. German cities used a wide variety of counterstamps for their nesting weights. Although these nesting weights were widely used for general purposes, on occasion they were made for checking coins. See Figs. 12, 13 & 14.

Cylindrical or flat weights were used by bankers and money exchangers to weigh coins & paper money in bulk, (Fig. 15.) Such weights sometimes carried an indication of the equivalent number of pieces of a particular coin or note. (Interestingly, the United States Mint used scales and weights to determine the quantity of silver dollars – 1,000 – placed in each coin bag for public distribution.)

Fig. 15.

Fig. 16

Coin weights of the Far East, a few of which were made of silver, can be

Fig. 17 Spanish coin-scale maker.

found in exotic shapes, such as ducks or other animals, (Fig. 16.) Their workmanship was exquisite. In Africa, the coin weights of the Ashantis frequently took the form of animals or humans, or were embellished with ornate lines and swirls (Fig. 15.) These, too, were occasionally fashioned of precious metal and intended for the chief's use.

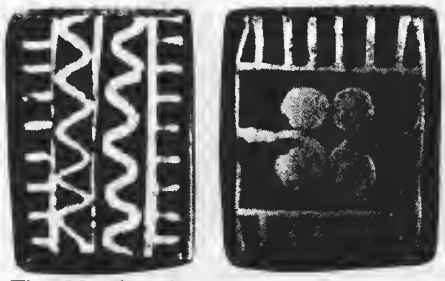


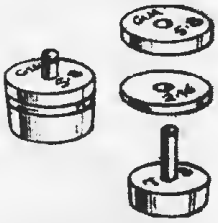
Fig. 18. Geometic patterns are typical of Ashanti coin weights.

Fig. 19. Fabricated in England for use with the Portuguese four escudos, this coin weight features a typical "symbol" reverse. The obverse is marked "36 SHILLINGS W".

Fig. 20, showing a monetiform 8 Reals, with the coin fully represented on the obverse.

Fig. 21, showing a monetiform 4 Reals with **part** of the coin represented on the obverse

Fig. 22 Compound weight for guinea, half & third.



Compound coin weights are comprised of a series of disks on a peg. Fig. 22. As a whole, they represent the weight of a specific coin in a series. The removal of disks allows the weighting of subordinate coins in the same series. Complete sets of compound weights are extremely difficult to find and are very rare if housed in their original scale box.

Fig. 23, Linderman shows 12 monetiform weights on his label.

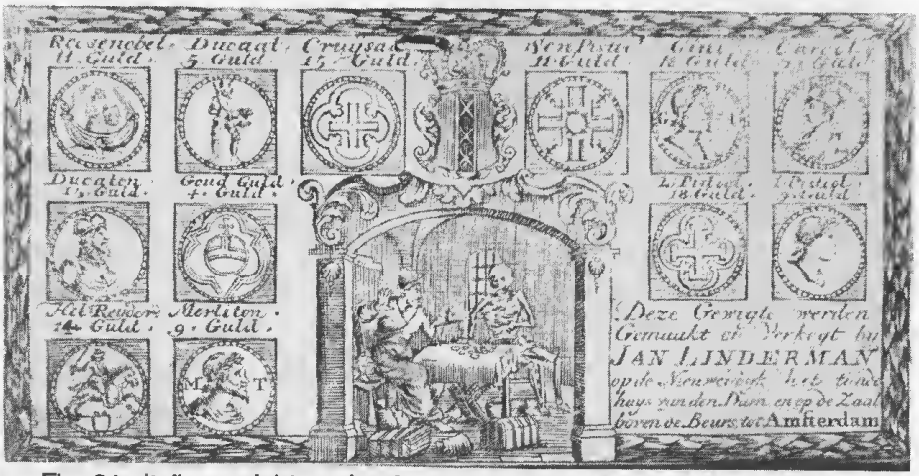


Fig. 24. Italian weight made after 1826 and verified in 1855.

Fig. 25. Monetiform weight made by Willem Bendemaecker in Amsterdam after 1657, to go in a box of coin scales used by a money changer in the Netherlands. It was to check an English Angel coin. Note how beautifully the dying dragon has been stylised into a line of pellets.

Fig. 26. A set of typical square weights complements an early 19th century French scale.

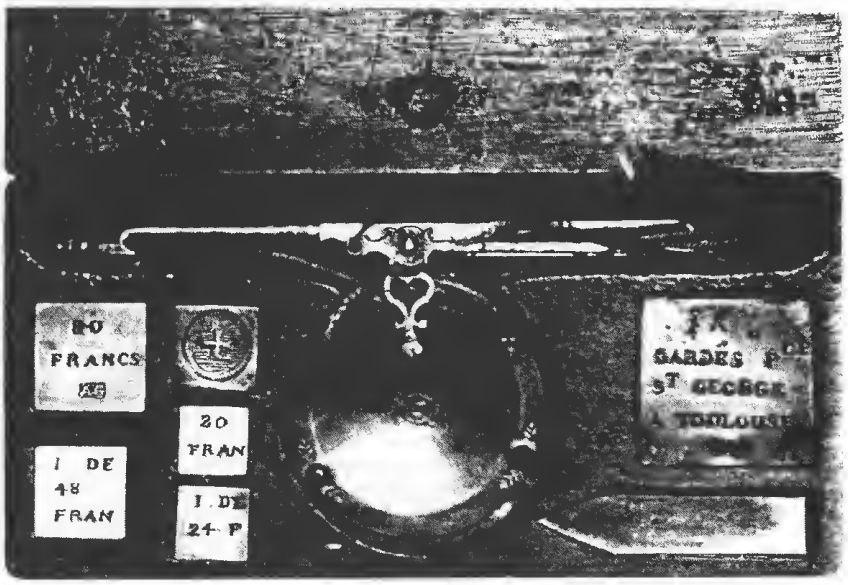


Fig. 27. English coin weight for the Half Portuguese Piece, valued in England at 36 shillings. A weight of great beauty, probably made between 1760 and 1775.

A collection of coin weights can be both aesthetically pleasing (Figs. 27, 28 and 29,)and numismatically significant. As their role in coinage history becomes more apparent, perhaps coin weights will be granted their rightful place in the study of numismatics.

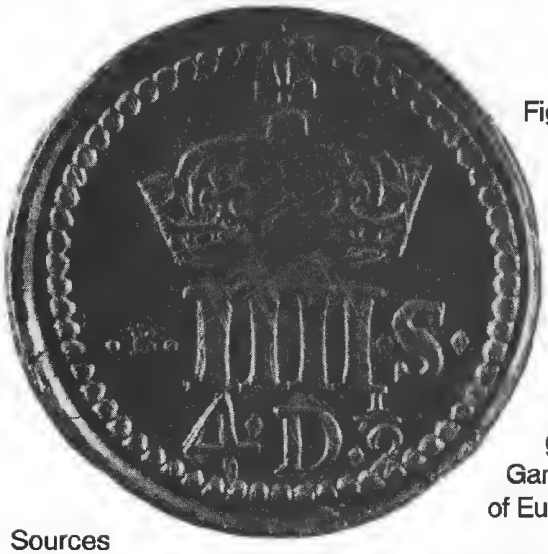


Fig. 28

Fig. 29

c. 1632
Thistle crowns
of James I
Two of the
superb photo-
graphs taken by
Gary Batz for his study
of European coin weights.

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Review

BY D.F. CRAWFORTH-HITCHINS

Auction catalogue "Alte Technik" 23rd May 1992, put out by Auction Team Koln Breker, Bonner Str, 528–530, D–5000 Koln 51, Germany. [US representative Jane Herz, 595 Grenville Ave, Teaneck, NJ 07666, U.S.A.] Annual subscription, for 2 "Technical Antiques" catalogues + 2 results sheets, 60 DM / Swiss francs, 200 French francs, £20 or $50, prepaid as a Eurocheque / cash or money order.

Although the editor uses auction catalogues as a major source of information, both visual and documentary, Equilibrium has had no reviews of such catalogues. This omission should be corrected, to emphasise the importance of such catalogues to a library (and possibly, on occasion, to alert our members to be cautious about the text of a catalogue.)

The Cologne team has mounted yet another of their intriguing auctions, composed mainly of 19th Century and early 20th Century tools, household equipment and mechanical objects that made living in that period so different from the agricultural life that preceded it. The categories include mechanical music; scientific instruments; optical devices; tools and apparatus of early professions; radio & TV sets; electrical appliances; early sewing machines; flat irons; toasters; household & kitchen antiques; automobilia; aeronautica; railwayana; bicycles; tobacco, beer & military beersteins; early vending machines; rare gambling machines; technical toys and industrial design material. If you are anything like members of my family your mouth will be watering now! Such a mixture of tempting objects! And photographs of all 1255 of them...

The collater had the problem of packing 1255 photographs and related text into a medium sized catalogue. The consequence is that the photographs are very small. However they are so crisp, well arranged, well focussed and with such clear use of shadows to define the shapes, that it is easy to see the condition, style and the lettering on labels. Two beams in the Measures section are shown upside down, one hanger is reversed and unfortunately two scales are called "opium–waage" [instead of the more appropriate "small dot'chin" or "Chinese steelyard".] Number 646 should have been labelled 'English,' but there are few errors considering that there are 48 scales and 14 sets of weights, from many countries and for many purposes.

In the other categories, there are many desirable objects, also superbly photographed, well explained and accurately dated.

The estimates imply reasonable prices, and I recommend that ISASC members subscribe to this auction house (and possibly also subscribe to the "Photographic and Film" catalogue and the "Office Antiques" catalogue.)

ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

1992—ISSUE NO. 4 PAGES 1609-1636

PAGE 1610

Cover Picture
Mediaeval Bronze Beam Part 2

BY D.F. CRAWFORTH-HITCHINS

Maurice Stevenson brought up the problem of finding out the period over which the ring and hole was used as a beam end on English scales, (See EQM, pages 1566 to 1569.) The consensus among authors is that we can't identify the prehistoric time when it started to be used, but we might be more successful with finding out when it died out, as that date must be well within the time when painters, commentators and archaeologists provide evidence.

The week that I posted off the last EQM, I was amazed to open our local newspaper and see a wonderful photograph of a wall-painting of St Michael with his scales – with a large ring and hole beam-end showing superbly. (Cover picture.)

I contacted the conservator who is cleaning the "protective" wax layers, [put on by the Victorians during the 19th century,] off the wall. We studied the photographs of the mural with care. I showed her our ring and hole beam-end, which illuminated the engineering for her, and she explained to me that the larger St Michael was painted over an earlier version of the same event – St Michael Weighing the Souls of the Dead. The smaller version also showed a ring and hole beam-end being used, partially obliterated by the bolder, more recent painting.

To deal with the later version first (Fig. 2,) the painting was done entirely in black, red and yellow, and shows, on the right, St Michael, nearly life-size, holding up his sword with his left hand, and grasping the shears and pointer of the scales with his right hand. His wings are open so that they nearly fill the upper part of the painting, and his cloak falls freely down his left side.

EQUILIBRIUM is published quarterly in January, April, July and October.

Editor—Diana Crawforth-Hitchins 15 Hawthorn Ave, Headington Oxford OX3 9JQ, England

ISSN-0893-2883

His limbs are covered with feathers, as all good angels are. The jaws of Hell are open horribly wide in the right hand corner of the painting, and a devil in Hell is straining to pull the devil in the scale-pan into those jaws, by heaving on his tail while another devil clambers over the right-hand beam-end. The devil in the scale-pan is blowing a horn to summon extra help, and a fiendish imp flies down from the air above Hell with a flesh-fork (used in Mediaeval households to turn flesh when it was cooking in front of the fire).

But all to no avail. The devils cannot be heavy enough, because the Virgin Mary is on the side of mankind. She is standing on the left of St Michael, draping her rosary over the beam-end, thus ensuring that her prayers are added to the prayers of mankind for the saving of the soul being weighed. The soul is consequently heavier than the devils, and so will go to Heaven.

I explain this in detail, because the conservator, Madelaine Katkov, had to explain the symbolism to me. She told me that the later mural was probably painted in about 1500, and that it *had* to pre-date 1547, the last date on which any mural was ever painted in an English church. Although the mural was touched up in 1869 [during which the Virgin Mary's face was subtly altered by the restorer to give her a Pre-Raphaelite face] it is thought that the scales were not altered. So we have very clear evidence that the anonymous artist of about 1500 was accustomed to ring & hole beam-ends, with three chains or cords going down to shallow bowl-shaped pans.

Because the cords are so much shorter than they would have been in reality, one might surmise

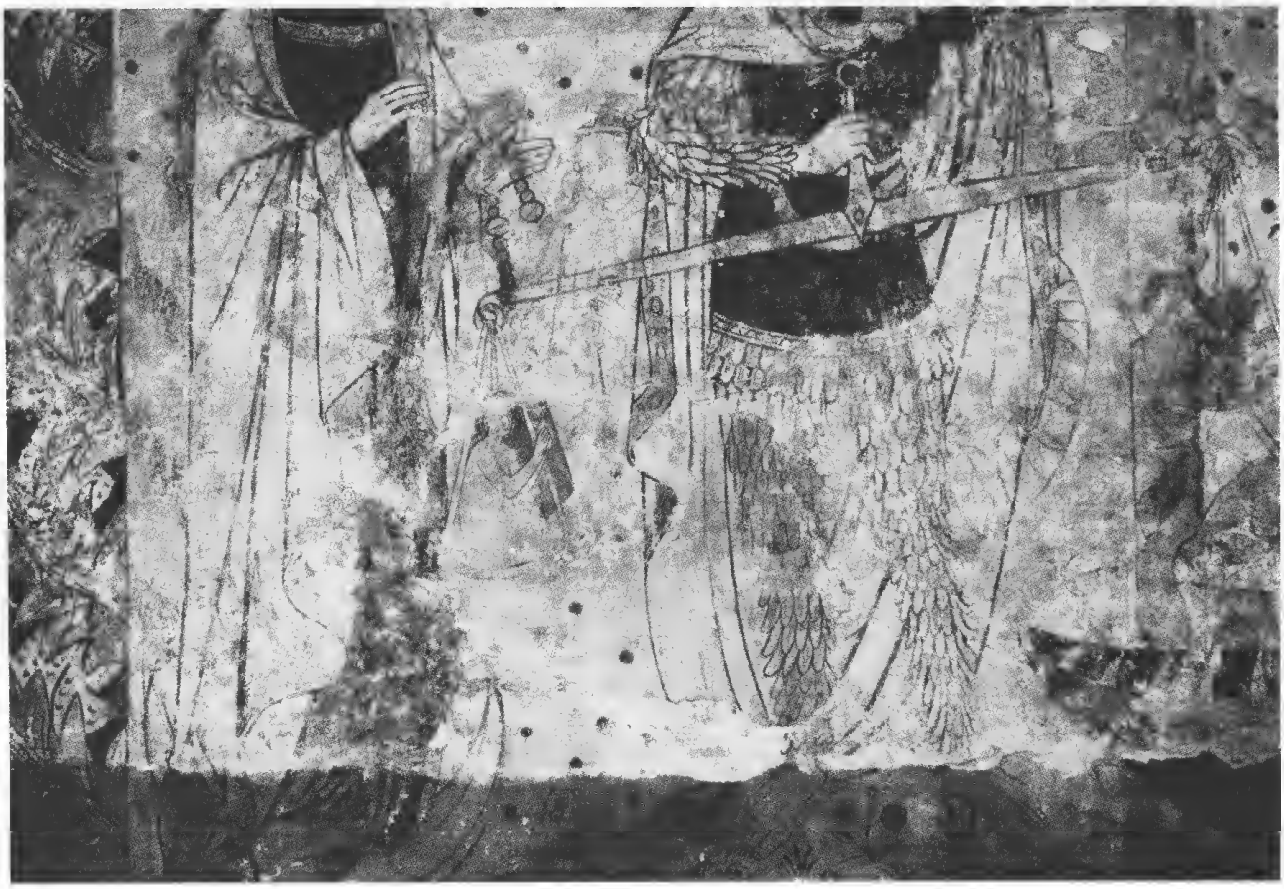


Fig. 2

1612

that the artist did not know accurately what beam-ends looked like either, but I believe that the artist was accurate where he could be, and only altered the cord length to fit the picture onto the wall-space available.

The earlier version that was painted onto the wall (Fig 3, page 1612) was only two-thirds of the height of the later version. The story is virtually the same, except that no rosary shows, and the Virgin appears to be stretching out her hand mercifully instead. The scale is being held properly by its huge tassel by Saint Michael, so that the beam could swing freely. The hole and cord beam-end shows amazingly clearly, with two cords going through the beam-end, held tightly by a ball below the beam, and spreading out to the four corners of the pallet/pan on which the devil is sitting. The jaws of Hell again open wide, with horrid teeth gaping, the nose wrinkled and one wide eye staring at the potential victim. There appear to be two little wheels under the jaws, as if the jaws were stage scenery in a Mediaeval mystery play, perhaps there to prevent the children from having nightmares about going to Hell.

The murals can be seen at the Church of St. James the Great, at South Leigh near Witney in Oxfordshire. Grateful thanks are given to the Vicar and to the conservators who are preserving this valuable piece of history. Madelaine Katkov is thanked for the hours of help she gave and for the photographs.

Notes & Queries

Note number 118 — from G. Houben

On page 1566 of EQM is an article by Maurice Stevenson about old folding scales. Dr Heiko Steuer wrote about this subject "Zusammenklappbare Waagen des hohen Mittelalters" (in central and northern Europe) in Archäologisches Korrespondenzblatt, 7/1977, pp. 295/300, and "Eine mittelalterische Klappwaage vom Hang de Burg Pless" in Plesse-Archiv, Heft 18/1982, pp. 19/31.

Hans R. Jenemann wrote in Trierer Zeitschrift, 1985, pp. 173/182 about bronze equal-arm balances from Roman and Mediaeval times, with 6 photographs of beams in the Landesmuseum of Trier.

About the tumbrel much has been written:

G. Galster	"En Seiger fra Alborg" in Kulm, 1961, pp. 116/124.
T. Kroha	"Die Münzwaage in der Geschichte de Geldes" in Das Fenster, 2/1966.
B. Kisch	"Scales and Weights", 1965, New Haven, p. 70.
S. Margeson	"Tumbrel or coin-balance" in The Archaeological Journal, 139, 1982, pp. 244/247.
N.J. Mayhew	"A tumbrel at the Ashmolean Museum" in the Antiquaries Journal, 1975, pp. 394/397.
A. MacGregor	"Coin balances in the Ashmolean Museum" in the Antiquaries Journal, 1985, pp. 439/445.
C. Marshall	"The medieval Tumbrel or Coin balance", Treasure Hunting, 3/1987, with more literature about 9 English tumbrels.

German CCDs – Ph. J. Maul

By J LINDNER

Philipp Jakob Maul was called, in his day, by experts, "the Father of the Letter Balance", and even today his firm is known for its letter balances, but only a few people know of the counterfeit coin detectors which he produced for a short time when he started his business. To widen our knowledge of him, we need to take a short look at the founder, and the rise of his undertaking.

Philipp Jakob Maul was born on 23rd February, 1841 in Jugenheim, in the district of Bingen in the Grand Duchy of Hessen. He was a subject of Hessen until he obtained citizenship of Hamburg on 30th May 1912[1]. He learned the trade of a precision-instrument maker in Kaiserslautern, then he was a journeyman in Paris, working for a firm that may have made barometers. He worked in England, then finally he went to Hamburg[2] where he was registered at the Registration Office on 26th July 1872[3]. Two years later, on 26th September 1874, he notified the Police in Hamburg of his profession as "mechanician"[4]. *[Editor – a mechanician was more than a mechanic. The English equivalent was manufacturing-engineer or instrument maker.]*

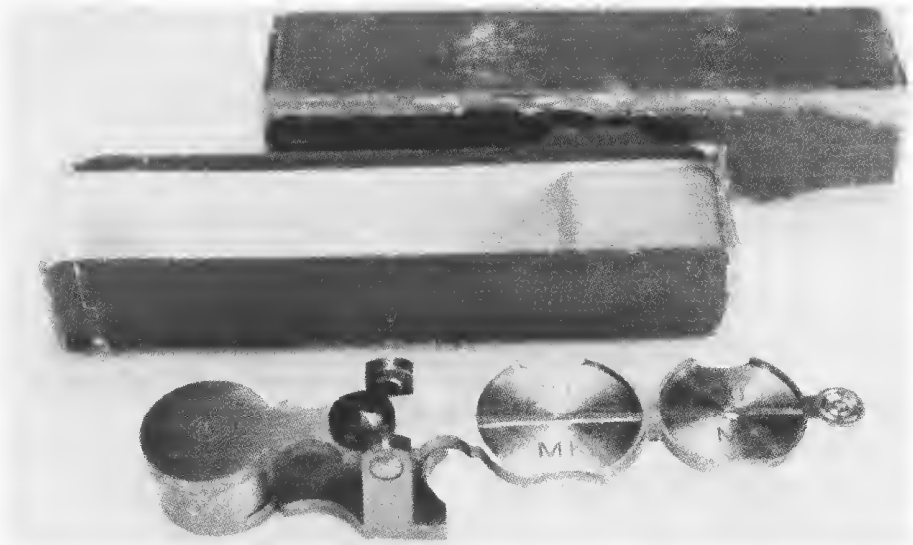
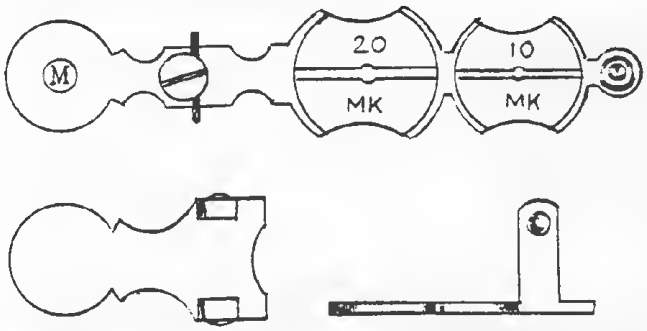


Fig. 1.
Maul CCD with special box. The interior has a shelf on which the rocker beam rests, to prevent movement

It has been reported that he began his activities with the manufacture of letter-balances, cutting each part laboriously by hand; at first, as the sole member of his firm, going himself to sell his products in Hamburg[2]. Because of the quality of his scales, and the rising demand for them, he was soon able to enlarge his factory, and on 23rd October 1885, his firm was registered, under number F. 23177, in the commercial register of Hamburg. It even survived total destruction by Allied bombing in July 1943, and it remained registered until it was blotted out on 23rd August 1989[5].

The firm of Ph. J. Maul has prospered for the last hundred years, mainly because of the letter balances, and in the firm's catalogues (dating back to about 1906) there is not the slightest hint of Counterfeit Coin Detectors *[henceforth called CCDs.]* Even the oldest advertisement which could be found of the "Greatest manufacturer of German letter and paper balances entirely constructed by the owner, (production of 50 to 60,000 balances per annum)" advertised in the year 1892, only advertises letter balances[6]. Presumably CCDs were no longer in production.

Fig. 2, Crawforth's figure 76.



Even within the company itself, CCDs are completely forgotten, and only a few specimens discovered recently can be traced back to Ph J Maul definitely, because of his symbol's being on them.

All CCDs produced by Maul are rockers[7]. On these rockers, there is a constant weight on one end of the beam (counterpoise) and on the other end of the beam, at fixed distances from the central pivot, platters for the coins to be tested, (Maul's were plain, circular depressions) placed so accurately that the beam at the load-end only dropped if the weight of the coin was equal to, or heavier than, the current weight of the coin.

But what caused Ph J Maul, at a time when CCDs were uncommon in Germany[8] [9], to make testers for the new gold coins of the German Empire?

2. W & T Avery

Nothing is known of the activities of Ph J Maul during his time in England, but it is striking, on reading Michael A Crawforth's booklet 'Standard Rockers'[7], that the sovereign rockers shown in his Fig. 9 and Fig. 47, (shown here as Figs 3 & 4,) stamped W & T Avery Ltd, are, in shape and size, virtually identical to the CCDs of Ph J Maul, of which there is an example shown in Fig. 76 of the booklet, (shown here as Fig. 2.). It is very remarkable, moreover, that the sovereign rocker stamped W & T Avery Ltd is the only English rocker described by Crawforth as having the knife-edge retained by a large blued-steel screw. It also has a finial on the load-end that is a disc with concentric grooves in it, exactly the same as those on the CCDs of Ph J Maul. (See Fig. 2 and Fig. 3.) The steel screws of both CCDs have exactly the same diameter of 9 mm, so the only difference between them is that the Avery is generally wider where the counterpoise joins the beam (see Fig. 5,) and the Maul CCDs are always narrow, which is more elegant. *[Note that the sovereign weighed 7.988 g with a diameter of 22.05 mm and that the 20 Mark weighed 7.965 g with a diameter of 22.5 mm. Because they were so nearly the same, the CCD needed no alteration in design.]* Finally, Avery's CCD was nickelled, with gilded platters, whereas the Maul was all brass, and the standard of the Maul's finish was superior.

Fig, 3, Crawforth's figure 47

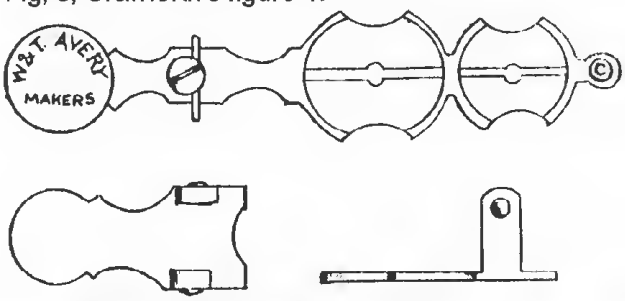
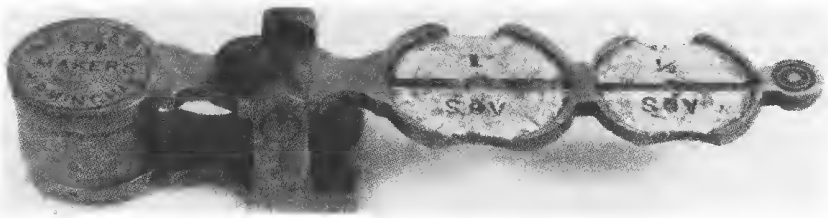
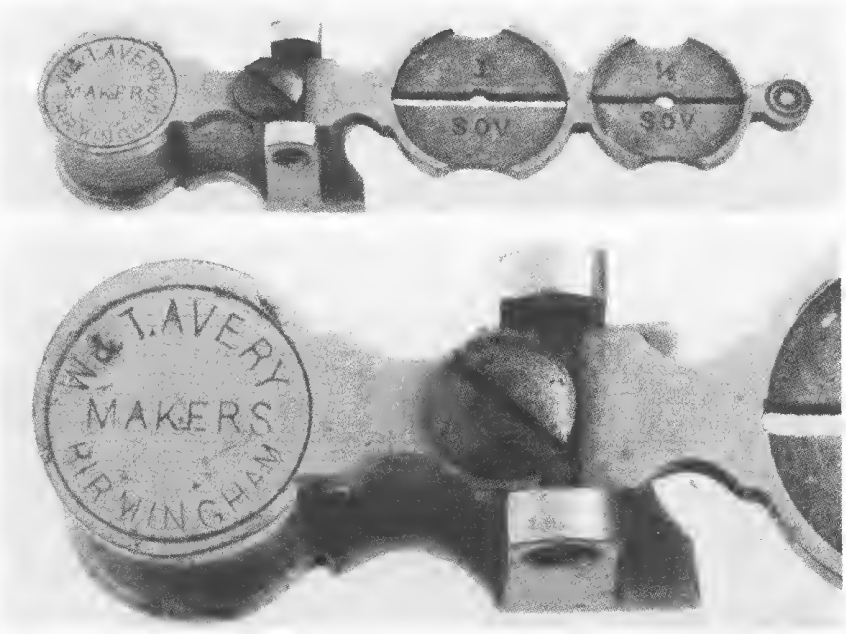


Fig. 4, Crawforth's figure 9.



A relationship between the CCDs of Maul and Avery may be more than coincidence, and presumably Maul took home the idea of CCDs from England. Perhaps he even worked at W & T Avery's as a mechanic, and was possibly the inventor of this efficient

Fig. 5, full size and 5A, double size.



means of mounting and repairing the knife-edge.

In the Avery Historical Museum in Smethwick, Birmingham, there are two CCDs of this kind, one for testing lira and half-lira, and the other for sovereigns and half-sovereigns. Both have W & T Avery **Ltd** on the counterpoise, as in Fig. 4[7] which proves that manufacture was after 1891, the date on which Avery's became a Limited Company. In the surviving Avery catalogues (of 1830 onwards,) this CCD was only in the 1895 catalogue. It must also have been made before Avery's became a Limited Company, as proved by Fig. 5A, which was made by W & T Avery. But as to Maul's being a mechanic at Avery's, they kept no records of employees, and none can be expected to turn up after 120 years. *[See alternative ideas on page 1627. Editor.]*

3. The Standard Model

Because Ph J Maul's firm was founded at about the same time as the official introduction of the exclusive use of the Reichsmark decree of 28th June 1874[9] , could he have produced CCDs before 1st January 1875? Perhaps he was inspired by his sojourn in England, so that CCDs might have been his first products. They were made extraordinarily carefully, and the hand-craftsmanship is unmistakable. Therefore Ph J Maul could probably be called 'The Father of the German Reichsgold Coin Testers' too.

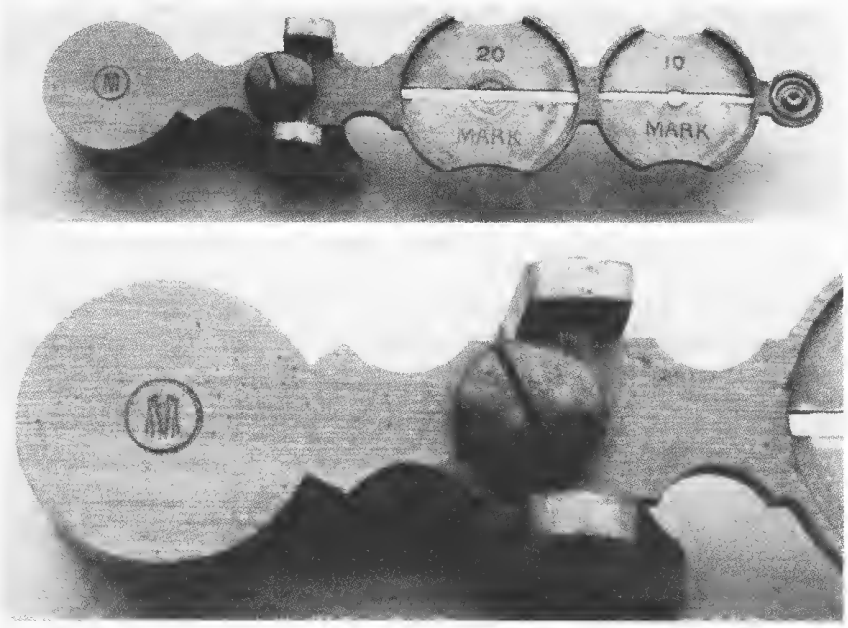
Perhaps because he did not have the expected success, he later specialised in manufacturing letter balances, (see pages 1627-1636.) It is possible that the model of a gold balance shown by Professor Reuleaux at the April meeting of the *Verein zur Beförderung des Gewerbefleisses in Preussen*[10], could have been a CCD of Ph J Maul[8]. This CCD may have stimulated other mechanicians and inventors, (for example, Alex and Aaron Bernstein,) to design similar CCDs.

Maul called his CCDs 'Sicherheitswaagen', *[literally, safety or security scales,]* see Fig. 9 and 12A. The rockers have (like the sovereign rockers of W & T Avery,) two circular indented platters of the same diameter as the coins to be tested, in this case of 22.5 mm for the Twenty Mark piece and of 19.5 mm for the Ten Mark piece[11], and a slot across the centre of the platter of the exact thickness of these coins. Thus the weight, diameter and thickness of the coins can be checked.

The CCD in Fig. 6 was probably his first type. It had the designation "MARK" on the platter, as that was the designation on the German Reichsgold coins after 1874. It had the small M enclosed in a circle. It was not a trade-mark, because his firm was not as yet registered in the Commercial Register of Hamburg[12], so it was not a protected mark. It is interesting to view this first symbol

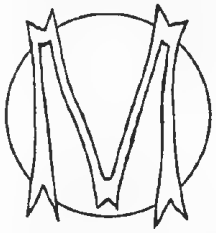
under a lens, as it shows that each point of the M is likewise shaped into an M (see Fig. 7.) Compare this early mark with the later symbol, trademark no. 123847, of 14th July 1909 at the Imperial Patent Office in Berlin[13], which was used, alongside other trademarks, until the firm closed in 1989. The 1909 trademark has the M surrounded by a diamond shape, each side of which is interrupted by an M (see Fig. 8.) The finial of the load end, as on the CCDs of W & T Avery, is a little disc with concentric grooves, which could be tapped during use, if the coin being tested was too light, or if dirt was causing the counterpoise to stick to the base.

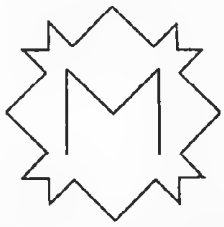
Fig. 6, full size, and 6A double size.



In about July 1877 Maul changed the designation from 'MARK' to the abbreviation MK (see Fig. 2[7]) and this abbreviation was used on all subsequent CCDs by Ph. J. Maul. The next production batch had the old shape, but with the abbreviation MK, and with the new "Ph. J. M. Sicherheitswaage" (see Fig. 12A) on the counterpoise. This symbol was very similar to his first trademark, no. 1104[13] (Fig. 13,) which Ph J Maul notified on 22nd June 1888 at the Commercial Register of Hamburg. The trademark was symbolic of the graduations on his letter balances, and thus pointed to the main product of his firm by 1888.

Fig. 7 and Fig. 8.





Until the spring of 1877, CCDs were produced without regard to the Reichsgold coins of Five Marks, because, until then, these were not minted, and nobody knew whether they would be minted. However, on 22nd April 1877 minting of Five Mark pieces started at the Berlin Mint[14]. For testing these "Goldfüchse" *[literally, golden birds or red-haired men]* there were two ways

Fig. 9, picture courtesy of the Hellweg Museum, Unna

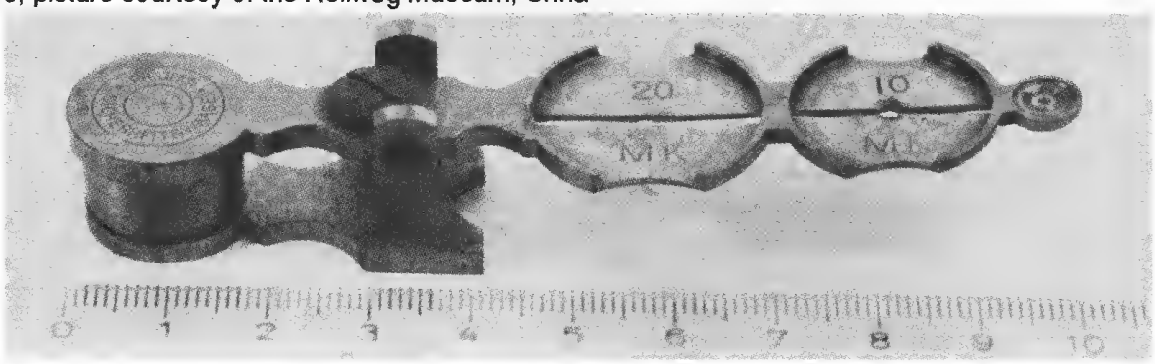


Fig. 10. Disc to superimpose on the Ten Mark platter.

Fig. 11.

in which the CCD could be modified; either to extend the beam on the load-end and fit it with an extra platter for the Five Mark piece, or to leave the old CCD as it was and use an additional weight, of 19.5 mm diameter, in the platter for the 10 Mark piece. Ph J Maul used the second solution at first, so that he could use up his stock of CCDs. He made small round plates of brass (see Fig. 10) with a theoretical weight of 1.9873 grams (that is, the current weight for a Ten Mark piece minus the current weight for a Five Mark piece), having an outer diameter of 19.5 mm, so that they fitted exactly into the Ten Mark platters. The new plates had themselves indentations of the exact diameter of the Five Mark piece, 17 mm, and a slot of the thickness of the Five Mark piece. Now the Five Mark piece could be tested for authenticity, if it was put on top of the new platter in the indentation for the Ten Mark piece. These small plates had only an "M" for Mark. This abbreviation was made legal by the resolution of the Bundesrat of 7th November 1874[15] when it was stated that the abbreviation for "Mark" should be "M". The small plates are rarely present today, as they were easily lost, and were only in use until 30th September 1900, when the Five Mark piece was demonetized in the German Empire[16].

Fig. 12, full size.

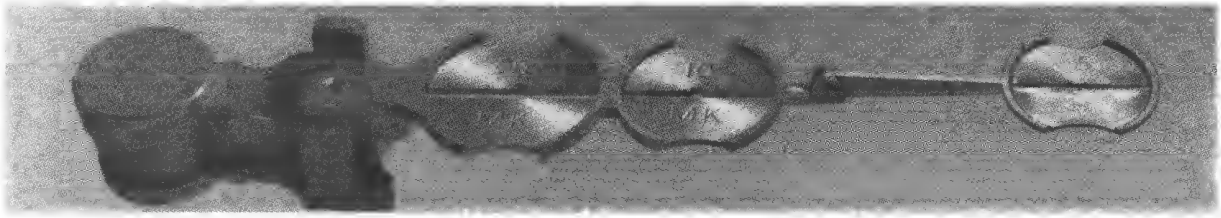


Fig. 12A, double size.

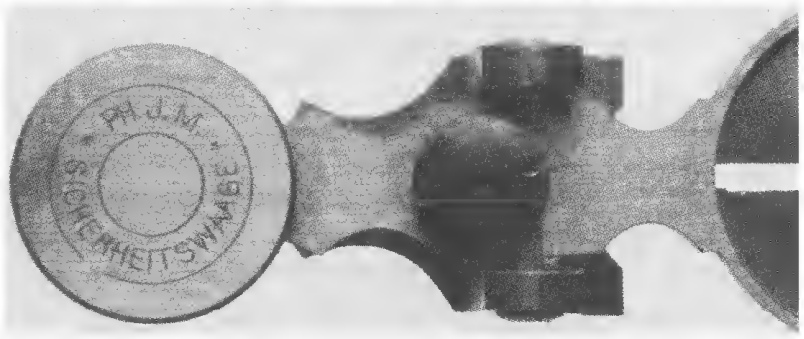


Fig. 13

4. Expanded Standard Model

After his original CCD, Ph J Maul produced an expanded version with an extended beam, having an extra platter at the load-end for the Five Mark piece. To prevent the CCD from being too long, Maul changed the little finial into a hinge, (see Fig. 12,) so that he was able to place the balance, with the beam folded, into the shorter box of the standard model. (see Fig. 11.) To compensate for the mass of the extended beam, he placed an additional disc on top of the counterpoise, stamped with his symbol, (see Fig. 12A.) Ph J Maul did not, apparently, make CCDs with extended beams for Five Mark pieces cast integrally with the beam, (without hinges,) even though other, later producers did manufacture CCDs without hinges, for 20, 10 and 5 Mark pieces.

5. CCDs with Means to ascertain Loss of Value.

Ph J Maul wanted to improve on his CCDs, or to invent something new, as did many mechanicians of his day. He added a sliding weight to the load-end of the beam, with graduations for the exact amount of gold lost. These graduations did not indicate the missing weight, but the missing value in Reichsmark currency, (Pfennigs.) See Fig. 15A. So that the user was able to set up the CCD horizontally, it had a spirit level on the base, with a screw-leg to raise or lower one end of the CCD, and there were two pointers or indicators beyond the coin platters, which had to meet horizontally, to give a more precise reading of minute amounts.

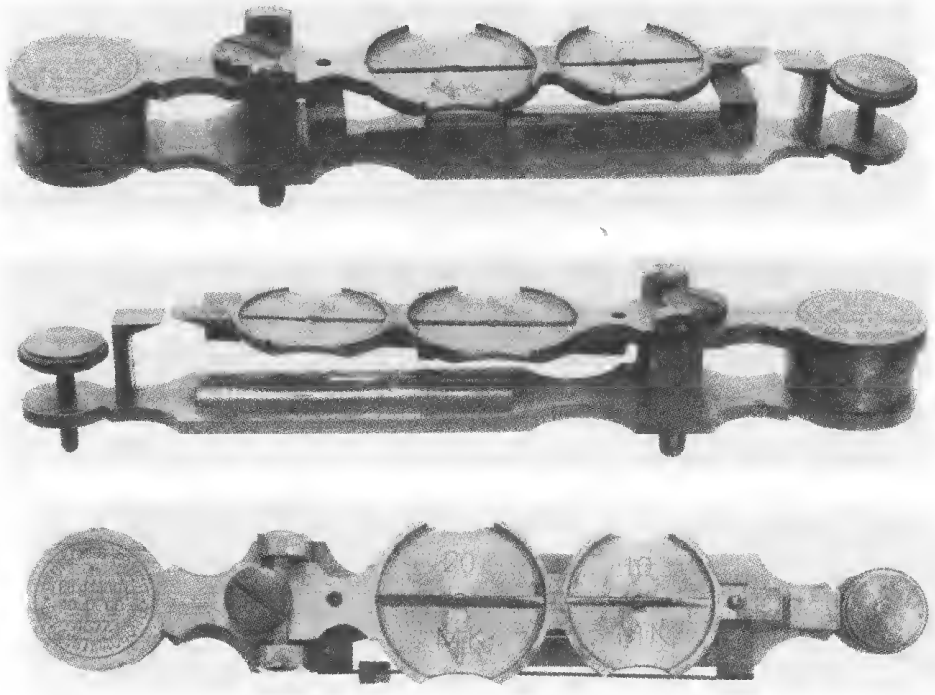
On 1st November 1877, Maul applied to the Imperial Patent Office for a patent for this CCD, the 'Taschengoldwaage mit Wasserwaage und Scala,' *[literally, Pocket gold scale with Spirit-level and Graduations.]* See Fig. 16 for the original specification and Fig. 14 for the translation.

TRANSLATION OF THE SPECIFICATION

The innovations refer to pocket gold coin balances of the construction shown in the accompanying drawing, and consist of the attaching of a spirit-level (a) to the base of the balance, and of a graduated board (c) with a sliding weight (r) to the side of the balance, to indicate clearly the value of gold missing, by the loss of mass of the pieces to be weighed. The division of the graduations is done in such a way that the sliding of the weight along one unit corresponds to the value of ten Pfennigs if weighing a Twenty Mark piece. If weighing the Ten or Five Mark piece, the same unit corresponds to the value of twenty Pfennigs.
PATENT CLAIM: The represented gold balance, when combined with a spirit-level and a graduation board, for the purpose and in the manner described above.

Fig. 14

He got provisional protection on the 10th December 1877[17], and he got full protection on 16th July 1878[18], back-dated to 2nd November 1877, for fifteen year's duration. The patent, number 2088, (see Fig. 16) was the first patent taken out by Ph J Maul.



Figs 15A, 15B and 15C.

Surviving examples conform exactly to the specification. In Figs 15A, 15B and 15C are shown the front, the rear, and the top view, respectively. The graduated plate was originally silver-plated, but only vestiges of silver remain.

From the patent specification, shown in Fig. 16 and translated

Fig. 16. Translation in figure 14.

PATENTSCHRIFT

1877. — № 2088 — Klasse 42.

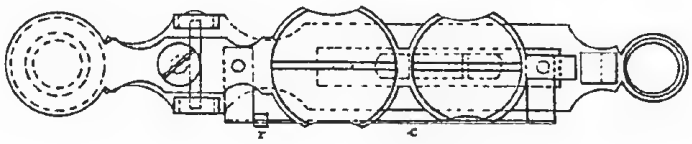
PHILIPP JACOB MAUL IN HAMBURG.

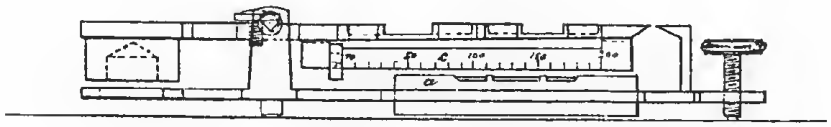
Taschengoldwaage mit Wasserwaage und Scala.

Patentirt im Deutschen Reiche vom 2. November 1877 ab.

Die Neuerungen beziehen sich auf Taschengoldwaagen von der auf beiliegender Zeichnung dargestellten Construction und bestehen in der Anbringung einer Wasserwaage *a* im Sockel der Waage und der einer Scala *c* mit verschiebbarem Gewichte *r* an der Seite der Waage, um bei einem Gewichtsmanco der zu wiegenden Stücke jederzeit den Werth der fehlenden Goldmenge erkennen zu können. Die Eintheilung der Scala ist derart, dafs die Verschiebung des Gewichtes um je einen Theilstrich dem Werthe von zehn Pfennigen Gold entspricht, wenn Zwanzig-Markstücke gewogen werden. Beim Wiegen von Zehn- und Fünf-Markstücken entspricht der gleiche Theilstrich dem Werthe von zwanzig Pfennigen.

PATENT-ANSPRUCH: Die dargestellte Goldwaage, welche mit einer Wasserwaage und einer Scala verbunden ist, zu dem Zweck und in der Weise, wie vorstehend beschrieben.





№ 2088.

PHOTOGR. DRUCK DER KÖNIGL. PREUSS. STAATSDRUCKEREI.

in Fig. 14, one concludes that the patent was for modifications to a well-known CCD, consistent with the standard model shown in Fig. 9. It specified that each graduation "corresponds to the value of ten Pfennigs' worth of gold" for the Twenty Mark piece. The author checked this, and found it to be correct, but the assertion that "on weighing the Ten Mark and the Five Mark piece,

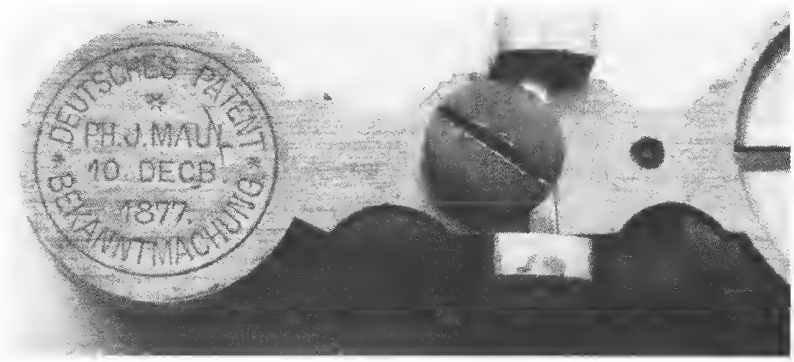
the same graduations correspond to the value of twenty Pfennigs" shows that Maul had not tested, empirically, what he had calculated theoretically when writing his specification. If he had tried, he would have found that the graduations for Ten and Five Mark pieces correspond, not to twenty, but to five Pfennigs. The declaration of the same value for both the Ten **and** the Five Mark pieces proves that both coins were located at the same distance from the central pivot point, so the CCD must have been the version with the small loose platter for the Five Mark piece, (see Fig. 10) described above, and made only six months after the first minting of the Five Mark piece[14]. The small platter was not mentioned specifically, which suggests that it was well-known, and too obvious to mention.

The "Pocket Gold Balance" came in a black cardboard sleeve with a cardboard drawer, and had a red label with gold inscription:-

Fig. 17.

Of special note is the date stamped on the counterpoise of the three surviving examples, (see Fig. 18.) Because the date is that of the patent **proclamation** *[i.e. the intention to gain protection]*, 10th December 1877, Maul obviously produced all three before the patent **enrolment** *[i.e. the granting of the patent]*, 16th. July 1878[18], as Maul would otherwise have referred to the enrolment. German Patent Statute number 40 stated that "Deutsches Patent" could not be used during the time of provisional protection because it was not definite that patent protection would be granted. For Maul, there was no problem, as the patent was enrolled anyway. In spite of the very ingenious and interesting construction his invention was unsuccessful, because it was an anachronism and not an appropriate design for ascertaining precisely how much value was lost from a coin. Obviously Ph J Maul did not perceive the consequences of the introduction of the Reichsgold Standard, and was still biased by the attitudes of the times prior to the introduction, which was a fault common to other contemporaries with similar inventions. Specifically, people no longer wanted to know precisely how much value was lost from a coin (in contrast to earlier need) because, after the introduction of the Reichsgold Standard for normal monetary transactions, Reichsgold coins were accepted by the German Empire at full nominal value[19], even when worn by circulation for many years. Now the only consideration was the genuineness of the coins, not any loss of gold[8]. But even an inferior value could not be ascertained precisely using Maul's CCD because the centres of gravity of the coins were not always situated in the centre of the coins, and therefore, by rotating the coins in the platter, various inferior values could be registered[8]. On 4th Feb 1879 the patent became void, by reason of the non-payment of the

Fig. 18, enlargement of Fig. 15, to double size.



additional stamp duty for the second year. Probably only one production batch was manufactured because no necessity for the CCD existed.

6. Conclusion

Ph J Maul presumably shut down his production of CCDs at the beginning of the 1880s, in favour of the production of letter balances. As his CCDs were not protected by patent, they were imitated by other producers. They copied the knife edge held in by a large blued–steel screw, but usually their screws were smaller (diameter about 7.8 mm) and the beams were less substantial and cast with different shapes. They can be differentiated from Ph J Maul's CCDs by their use of different stamps and type–scripts to designate the currency. Alternatively, it is possible that Maul was selling to retailers without his symbol on the CCDs, so that retailers could stamp on their own symbol, or they could leave them blank, so the only means of attributing the CCDs to Maul is by analysis of the typical distinctions of his methods of manufacture.

Credit for figures:–
Fig. 1, D Hitchins; Figs. 2, 3 & 4; M A Crawforth; Figs 8, 13 & 16 from official publications; Fig. 9; Hellweg Museum in the city of Unna; all other figures the author.

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2 Manuscript of a lecture given in 1978 by Otto Maul, the son of Ph J Maul, and 'Burghagens Zeitschrift für Bürobedarf' 52/19 of 16th September 1949 page 431. Both kindly given by Mr. Dieter Maul of Hamburg.
3 Staatsarchiv Hamburg. Allgemeines Fremdenprotokoll für Männer; Einwohnermelderegister.
4 Staatsarchiv Hamburg. Gewerbepolizei VIII C,volumn 10 page 349 No. 2788.
5 Geschäftsstelle der Abt. 66 des Amtsgerichts Hamburg (Handelsregister) und Deutscher Reichsanzeiger No. 252 of 27th October 1885.
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10 Verhandlungen des Vereins zur Beförderung des Gewerbefleisses in Preussen, 1875, page 48.
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12 Gesetz über Markenschutz, 30th November 1874. Reichsgesetzblatt No. 28/1874 page 143.
13 Lindner, Johannes, The registered trade marks of the firms "Maul", in "Mass und Gewicht" March 1989 pages 179 & 180.
14 Centralblatt für das Deutsche Reich 1877, page 236; The first 58,325 gold coins of 5 Mark were minted in Berlin in the week 22nd to 28th April 1877.
15 Centralblatt für das Deutsche Reich 1874, page 423.
16 Reichsgesetzblatt 1900, page 253.
17 Patent application No. 4606, proclamation in the Deutscher Reichsanzeiger No. 291, 10th December 1877.
18 Proclamation in the Deutscher Reichsanzeiger No. 165, 16th July 1878.
19 Gesetz, betreffend die Ausprägung von Reichsgoldmünzen, 4th December 1871. Reichsgesetzblatt 1871, pages 404 to 406.

Review

By D F Crawforth-Hitchins

Inventaire des Poids, *Collection des poids & mesures, Musée National Des Techniques, (CNAM,) 270, rue Saint-Martin, Paris 3, France, published in 1990. 146 pages, with 4 colour photographs, 223 black and white photographs, 5 drawings and a table of French marks. ISBN 2-90-8207-06-0. Price 75 francs, plus 45 francs for packing and postage to America, or 25 francs for packing and postage to countries in the European Community.*

This catalogue is part of a programme to update the old Conservatoire National des Arts et Métiers, now that it is the Musée National des Techniques. The original 1941 catalogue was 'Section K, Poids et Mesures Metrologie,' and included lots of length and volumetric measures, spring balances and steelyards, whereas the new catalogue deals only with weights and those scales that are in boxes with weights. The old catalogue was on brownish brittle paper, with small photographs of a few of the items, and was a tour de force considering its publication date, while the new one is a smart, well-photographed production with an illustration of nearly every weight they have.

It is divided into chapters on French weights, ancient, metric 1793-1839, common 1812-1839, metric after 1840; and Foreign weights, Belgium, Low Countries, Great Britain, Germany, Austria, Denmark, Sweden, Norway, Italy, Malta, Spain, Russia, Turkey, Egypt, Tunisia, China and the United States of America. Short chapters deal with weight systems , indices of adjusters, marks and types of weights, and a useful bibliography. The main chapters are meticulously divided into a set of headings for each and every weight, inventory number, denomination, époque, maker/country, material, shape, dimensions, date given to the museum, details of markings, mass and explanations if needed. This system answers virtually all questions in a brief, precise manner, easily used by French speakers and non-French speakers with a small dictionary.

The text and documentation was done by ISASC member, Aimé Pommier, the editor of the magazine of the French Scale Collectors Society, Le Système Métrique. As always, he has set himself the highest standards, and must be very proud of his achievements.

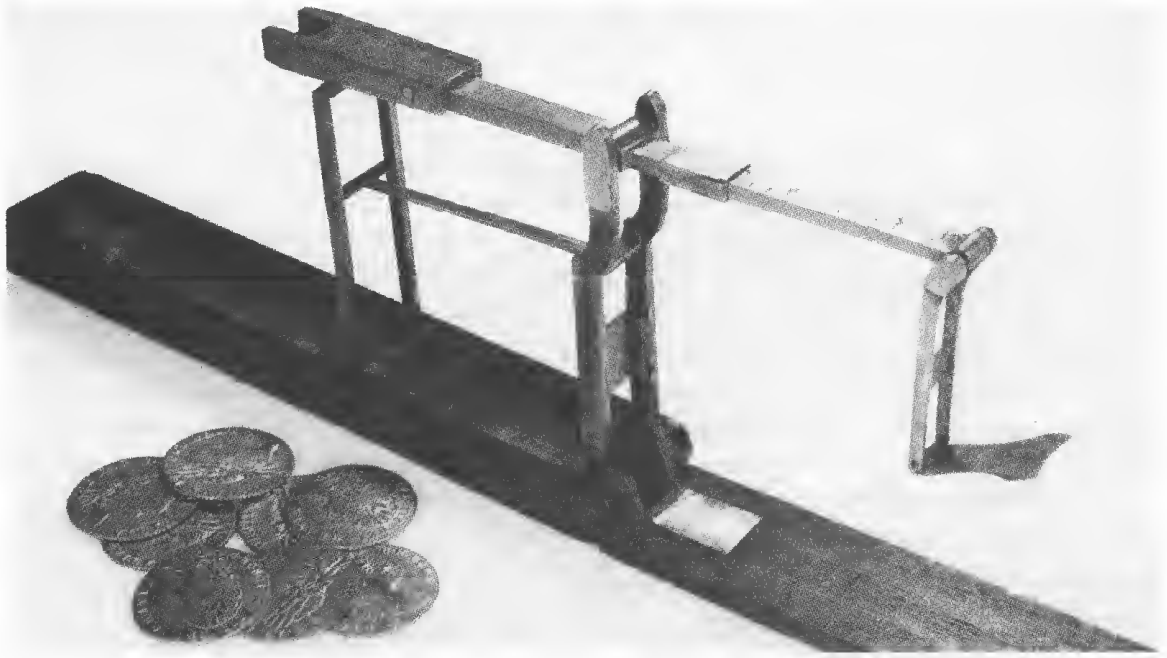
The details seem to be accurate, useful and complete. I could quibble on a few minor points but I would not wish to detract from an excellent publication. Any weight collector would be happy to receive this catalogue, and would refer to it with confidence.

Weighing the 7s. Coin

By S CAMILLERI

When the 7s gold coin (the third of a guinea) was introduced in the British Isles in October 1797, folding gold balances were still designed to weigh the two current coins, the guinea and the half guinea. The guinea was worth 21 shillings, and the least weigh acceptable for it to pass at a full 21s was 5 dwt 8 grains. The half guinea was worth 10 shillings 6 pennies, and the least weight acceptable for the full value was 2 dwt 16 grains. *[Folder beams were made to tip down if a coin of 5 dwt 8 grains was put on the coin platter when the turn was flipped away from the centre, or to tip if a coin of 2 dwt 16 grains was put on the platter when the turn was flipped towards the centre. (Fig. 1.) Alternatively, weights were supplied with the folder when the balance was an equal-arm scale. (Fig, 4.) The novelty was that both types had a pillar with a hinge at the bottom of it, and a pin hidden beside the hinge, attached to the lid, so that when the lid was pulled open, the pin pulled the pillar into the vertical position. Editor.]*

Fig. 1



Makers were thus, in 1797, faced with the problem of weighing a third coin of 1 dwt 18 grains. We know how they resolved this problem:- Anthony Wilkinson designed the double turn, (Fig. 3,) *[by splitting the piece of brass counterbalancing 2 dwt 16 grains, and allowing the user to turn the piece counterbalancing 22 grains towards the centre, so leaving only 1 dwt 18 grains still fixed to the beam, in effect, away from the centre]* and makers of loose weight folders just added a third weight of 1 dwt 8 grains.

Hamlet Bell of Prescot at that time made mainly turn-type folders, although he made a few loose weight folders *[in the ratio of 11 turn-type to 1 loose weight, judging by those surviving.]* He found a very simple solution : he added to his turn-type folder, enshrined inside its lid, a flat rectangular brass weight bearing two stamps, 3:6 and 22. 3:6 meant 3 shillings and 6 pennies, and 22 meant its weight in grains.

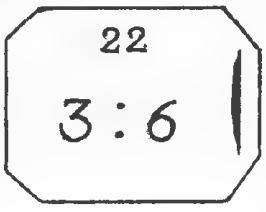
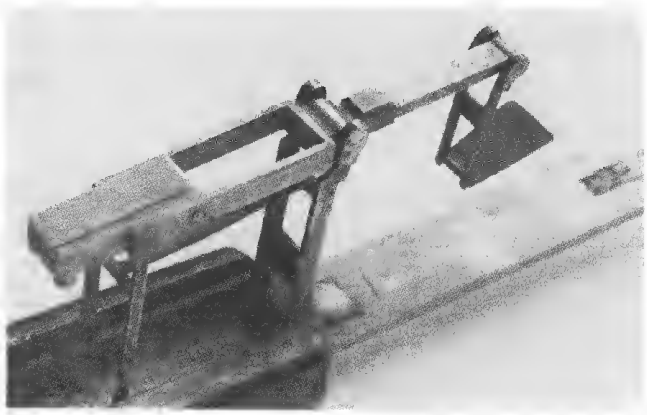


Fig. 2. Rectangular brass weight. Double life size. Original: 16.5 x 12.5 mm.

Fig. 3. A Wilkinson double turn folder.



By putting this rectangular weight on the coin–plate of his folder, and putting the turn ready for weighing the half–guinea, when he added a 7s coin, it would tip the beam down fully if it was full weight. *[If it did not tip the beam down, he could push the little slide along the beam until it did tip, ascertain how many pennies–worth of gold had been lost, and use the coin at the reduced value.]*

That is, by subtraction: 10s 6d – 3s 6d = 7s
or 2 dwt 16 grains = 64 gr, & 64 gr – 22 gr = 42 gr = 1 dwt 18 gr

One further note :In his article in EQM, pages 672 – 675, Michael Crawforth discussed his Five–turn folder, made by Anthony Wilkinson. Michael suspected the existence of a similar flat rectangular brass weight of 27 3/4 grains stored near the catch, in order to adapt the balance from weighing the 18s *[the quarter Portuguese piece of 4 dwt 14 3/4 grains]* to weighing the half moidore *[or 13s 6s piece of 3 dwt 11 grains].* Hamlet Bell's device gives evidence to support the correctness of Michael's conjecture.

Further details about folders can be found in Michael Crawforth's book, Weighing Coins, English Folding Gold Balances of the 18th and 19th Centuries, published by Arthur Middleton, 12, New Row, Covent Garden, London, WC2, in 1979.

Hamlet Bell – folder maker

Hamlet Bell was a wool and linen draper in Prescot, one of the little towns near Liverpool in Lancashire, from before 1781 until his death in 1820. As with so many proprietors in those towns, he used the buildings at the back of his shop as workshops. Most proprietors made little brass parts for watches and clocks, but Hamlet Bell made "money scales" [or folding gold balances, as we call them.] By 1795 he had two tenants living in the cottages at the rear of the shop, and within five years he had five tenants and the workshop was called a joiners' shop. This suggests that he made something out of wood – perhaps he made the little mahogany boxes with the special hinges to pull the folders up, and with simple spring buttons to hold the boxes shut. By 1805 he had lost two tenants, perhaps reflecting the reduced trade in folders after 1800, when most money was paper, and there were few coins available to be weighed. He recouped his losses by expanding to be a liquor merchant as well as a draper and a money scale maker. His Land Tax Assessments stayed much the same throughout his life, suggesting that he owned the same amount of property all his life, but by 1820 he had seven tenants and , when he died, he left a very reasonable inheritance to his son George, who was able to continue the folder business and the wine and spirit dealing for another ten years. Like Wilkinson, Hamlet Bell changed the designs of his folders many times during his life. This may have been because he liked variety, or it may have been because he got the parts made by different workers at different times and

they had different moulds for casting, or different patterns to cut out. We know that he had scales made for him by A. Wilkinson and by T. Houghton until T. Houghton's death in 1825, because T. Houghton used unique and totally distinctive designs for almost every part of his folders, but the name on the label was Bell's.

Hamlet Bell's designs were normally distinctive, and can be differentiated from any other makers, so that Michael Crawforth could say categorically that Bell made scales for John Whitley of Farnworth near Warrington, Joseph Denton of Hull and Mary DeGrave and Son of London, but that they put their own labels, specially printed to fit, into the folders.

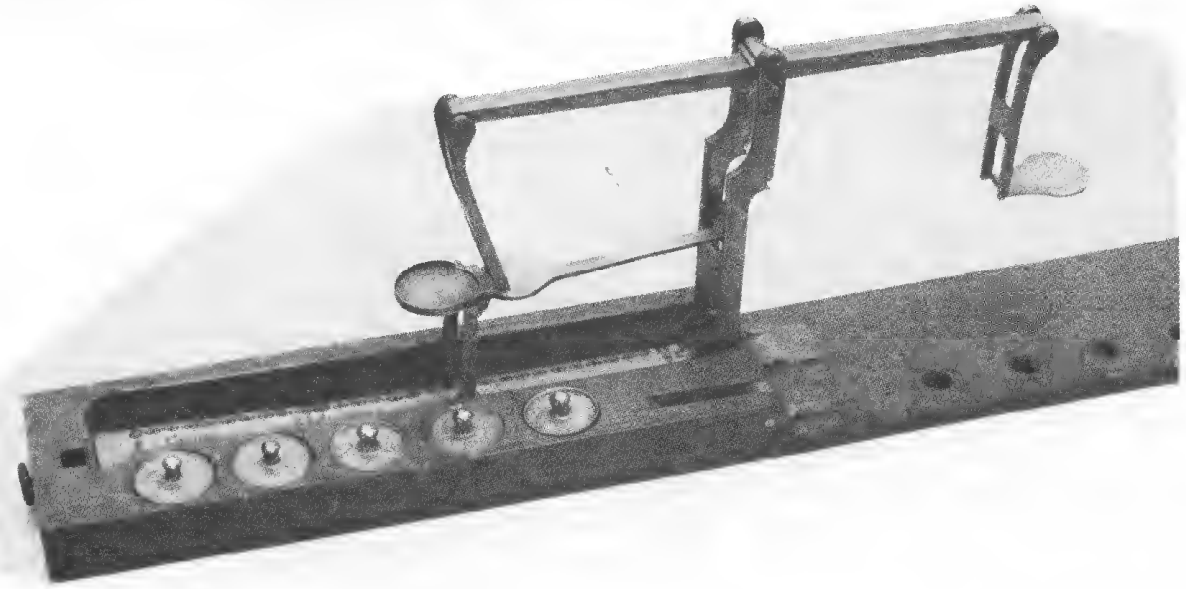


Fig. 4. H. Bell's equal-arm folder, made at the end of his life, when the sovereign and half-sovereign were minted [i.e. after 1817.] Note the absence of a slide to determine the amount of gold lost.

How did Hamlet Bell get his scales from Lancashire to London and to the provinces? He used the services provided by Peter Stubs, a tool-maker of Warrington. Peter Stubs had to send men around the country to get orders, to deliver goods (especially fine files) and to collect the money owed to him. He arranged, for a fee, to do the same for other manufacturers in Lancashire, including Hamlet Bell amongst others. This helped to keep Stubs' men fully and efficiently employed. Stubs sent out the goods by pack horse, carriers' wagons, canal barges and coastal ships, and virtually the whole of England was able to obtain excellent Lancashire products because of this one entrepreneur. Stubs ought to have been a very prosperous man, but actually it often took his men several visits to collect money owed, and sometimes his men had to visit unexpected parts of the country to collect money owed to his customers, in order that he could get what was his due!

So, Hamlet Bell had access to all of England, he had a group of men working for him and he had the advantage of three trades by 1820. Was he therefore a man of consequence in his community? It is difficult to tell. He did not move into a bigger house or finance a lot of children, but he kept going at a time when wheat was expensive, there was a war affecting trade with France, money was in atrociously short supply and he was in strong competition with his very successful neighbour in the next little town, Anthony Wilkinson.

Ph. J. Maul– Part 1

By D. F. CRAWFORTH–HITCHINS

As Johannes Lindner explains in the article on pages 1614 to 1622, Ph. J. Maul registered as a manufacturer in 1874 in Hamburg, but no advertisements from the first eighteen years have survived to help us to ascertain what he produced. The rockers, sold by W & T Avery Ltd. after 1891, were made by Maul, and exported to Britain with Avery's stamp on them, judging by the quality & method of manufacture. This assumption is entirely consistent with the advertisements regularly put out by Maul to encourage British traders to buy his goods, & equally consistent with Avery's trading methods of buying in from other manufacturers.

In 1888 Ph. J. Maul registered his trade mark & stated that he would place it on letter scales, writing equipment & metal goods. This gives great importance to the single illustrated sheet (Fig. 1), published in 1892, in which he claims to be the "Greatest German Maker of Letter and Paper

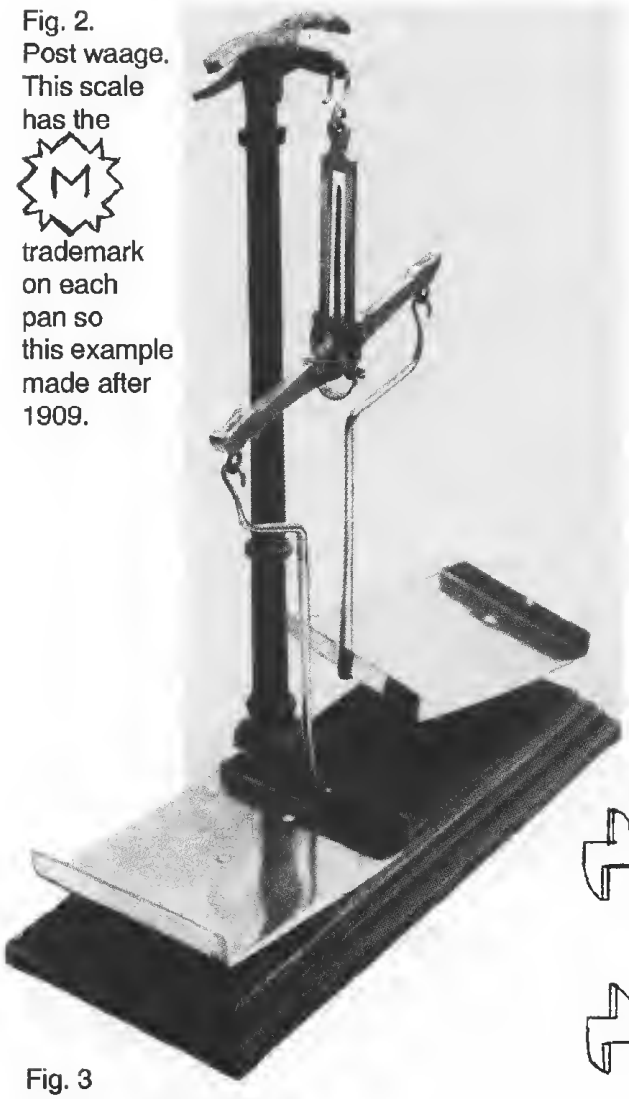


Fig. 2.
Post waage. This scale has the trademark on each pan so this example made after 1909.

Scales solely of his own construction" with production of 50, to 60,000 scales a year. The equal-arm postal scale in the centre (Fig. 2) was similar to scales made by many other German manufacturers, and consequently had a lot of competition, but it was in production, with very minor modifications, until well after 1921. It seems strange to those people accustomed to British postal scales, that there was no place for a set of weights, even though he stated that the postal scale had a capacity of only 500 gms. (approximately 1 lb.) The letter had to be propped up against the hanger in the French manner. The eagle on the top was made of brass but the 30 cm. (12 inch) pillar was made of iron.

The Roberval scale looks unexceptional, shown in such a small sketch, but the drawings of the parts (Fig. 3) may change

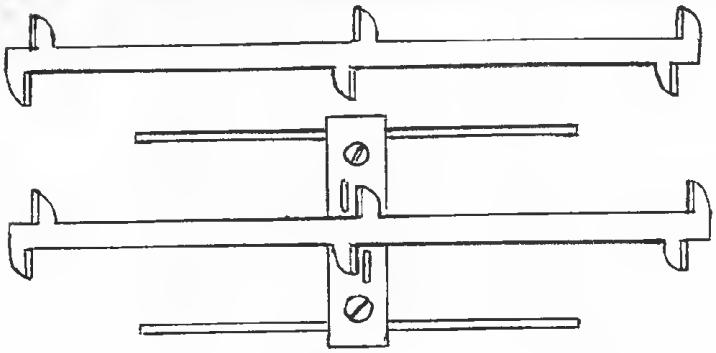
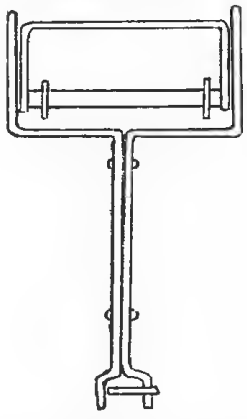
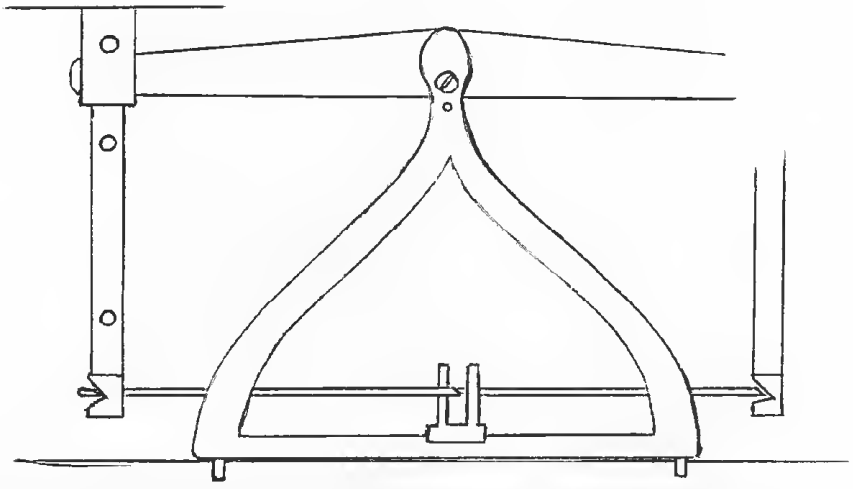


Fig. 3
Diagram of German roberval linkage, used by Maul from, at least, 1892.





your opinion. This elegant solution to all the problems of the Roberval was greatly admired by Michael Crawforth, as he was an industrial designer and spent his working life trying to find

cheap, efficient solutions. This set of neatly-cut brass parts slot together without excessive movement laterally or rotationally, with only a few screws to undo when it was taken apart. It was perfectly functional, hard-wearing and good looking. It was a typical example of all that was and is best about German industrial design.

The four single pendulum scales had code numbers that imply that Maul made many other models, but those shown were variations of size & leg type, rather than engineering varieties. They all worked by the pressure of the letter0 pushing the graduated board up to the left, passing the pointer fixed to the central pillar until equilibrium was reached. They all had a screw to adjust the verticality, & were made of folded metal strips, so were very economical to make, & required little equipment.

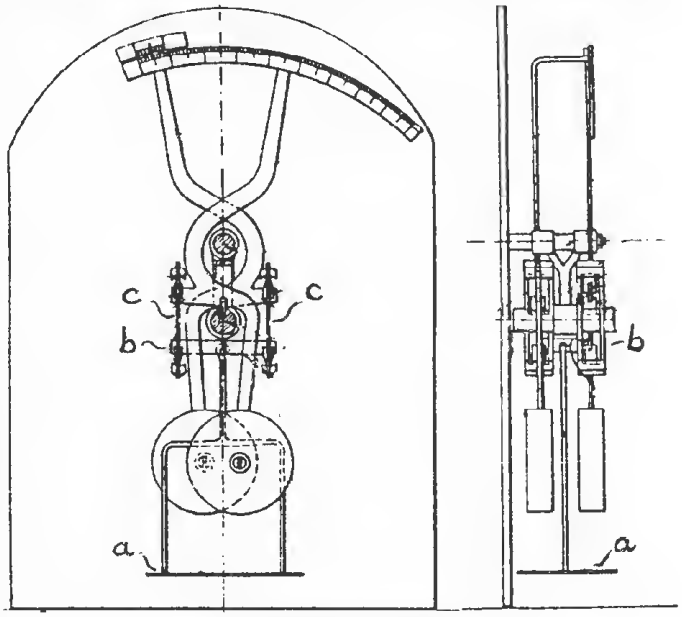
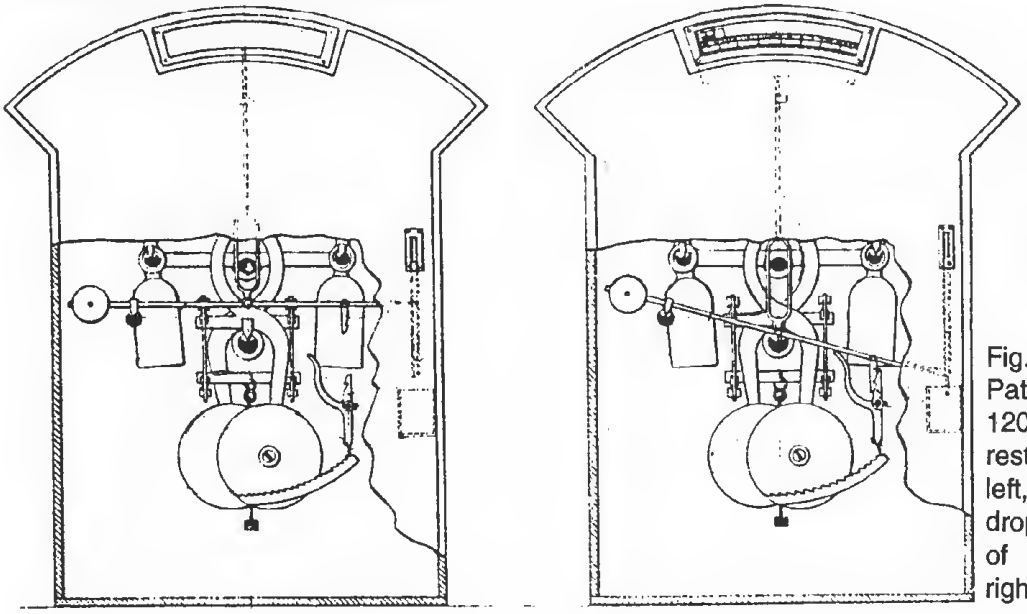


Fig. 4 Patent number 112860

Georg Hahn of Duisburg took out patent 112860 in 1899. This neat bilateral pendulum was sold by Ph. J. Maul between at least 1909 & 1912, but in a *very* modified version. The original patent (Fig. 4) was for a bilateral pendulum with a hanging pan (a) suspended from bar (b) which was centrally mounted. It pulled down two rods (c), one behind, which was attached to the rear left hand arm of the pendulum, & one in front which was attached to the front right hand arm of the pendulum. The arms rotated when pulled down in the normal fashion for bilateral pendulums, so that the top of each arm crossed, passing each other. The calibrated unit on the left hand arm was read against the calibrations marked on the casing.



Georg Hahn took out another patent, number 120187 (Fig. 5) in 1900, to modify his previous

Fig. 5
Patent number 120187. Showing the resting position on the left, and release arm dropped by the weight of the coin on the right.

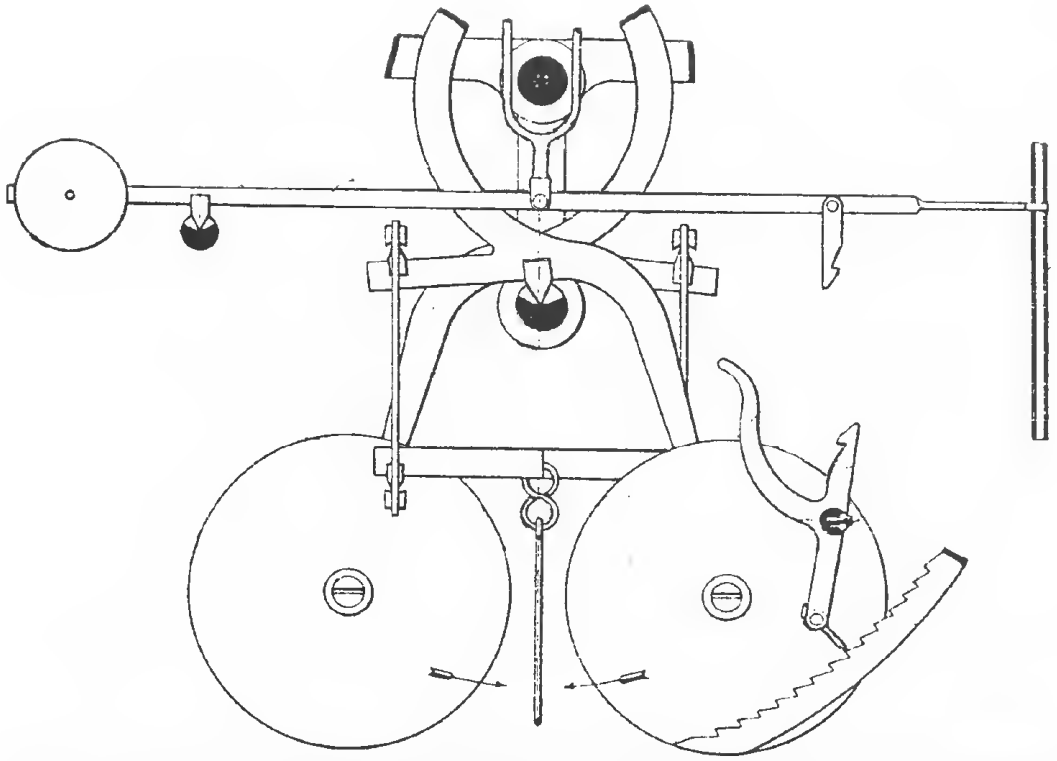


Fig. 5
continued.

patent. It was for a coin–in–the–slot release mechanism for his bilateral pendulum. Why Ph. J. Maul referred to this patent also, when he was advertising his Columbus scales (Fig. 6) in 1909 and 1912, is impossible to understand. Obviously Georg Hahn had framed his protection in such a way as to prevent other bilateral pendulum's being manufactured without his consent, or without payment to him for use of the patent – a neat commercial move that must have annoyed Ph. J. Maul.

Doppelhebelbriefwaagen Columbus

D. R.-P. 112860 und 120187 und viele Auslandspatente.

Beste Briefwaage für den Privatgebrauch

Gesetzlich geschützt

Die Waagen stehen auch auf geneigter Fläche immer auf Null, sie bedürfen daher keiner Stellschraube.

Fig. 6.

In 1903, spring–balance patent 156517 was taken out by W Jennfeldt of Schönningstedt B. Reinbek, and sold by Ph J Maul between 1909 and 1912 (Fig. 7.) The pointer went round five times, with each rotation moving the number in the window (labelled kilo,) up to the maximum of 4 kilos 999 gms. It had an adjustment screw between the three legs, presumably to tare the pan. The patent drawings (Fig. 8,) explain the huge ring shown below the pan. The 'ring' was the middle section of the horizontally mounted spring on which the pan rested directly. This use of a huge compression spring was unique, as far as the author knows. It used a very peculiar transmission system

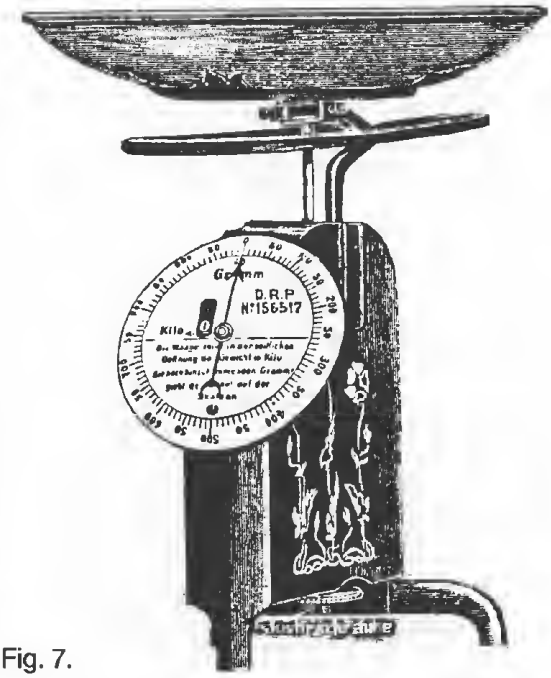


Fig. 7.

to convert the vertical push down on rod (c) to the arc of movement of the rack (d) which rotated the cog (e) attached to the pointer. The rod (c) was flexible in its lower part, wrapping round the cam attached to the arm of the rack as the rod went down. The secondary spring (f) appears to pull the rack back up after weighing was completed, even though the main spring should have done that as it resumed its original shape. The counterpoise (g) probably counterbalanced the weight of the rack (d,) the arm between them rotating round the pivot point in the centre of the little spring (f.) The cog (e) was not shown rotating a second cog, which must have been there to show the number of revolutions & thus the number of kilos. The taring screw at the bottom was not illustrated in the patent either. *[The author has never seen one of these peculiar balances, but hopes that a reader has one, & will be sufficiently enthused to open the casing & investigate the system in order to enlighten EQM readers.]*

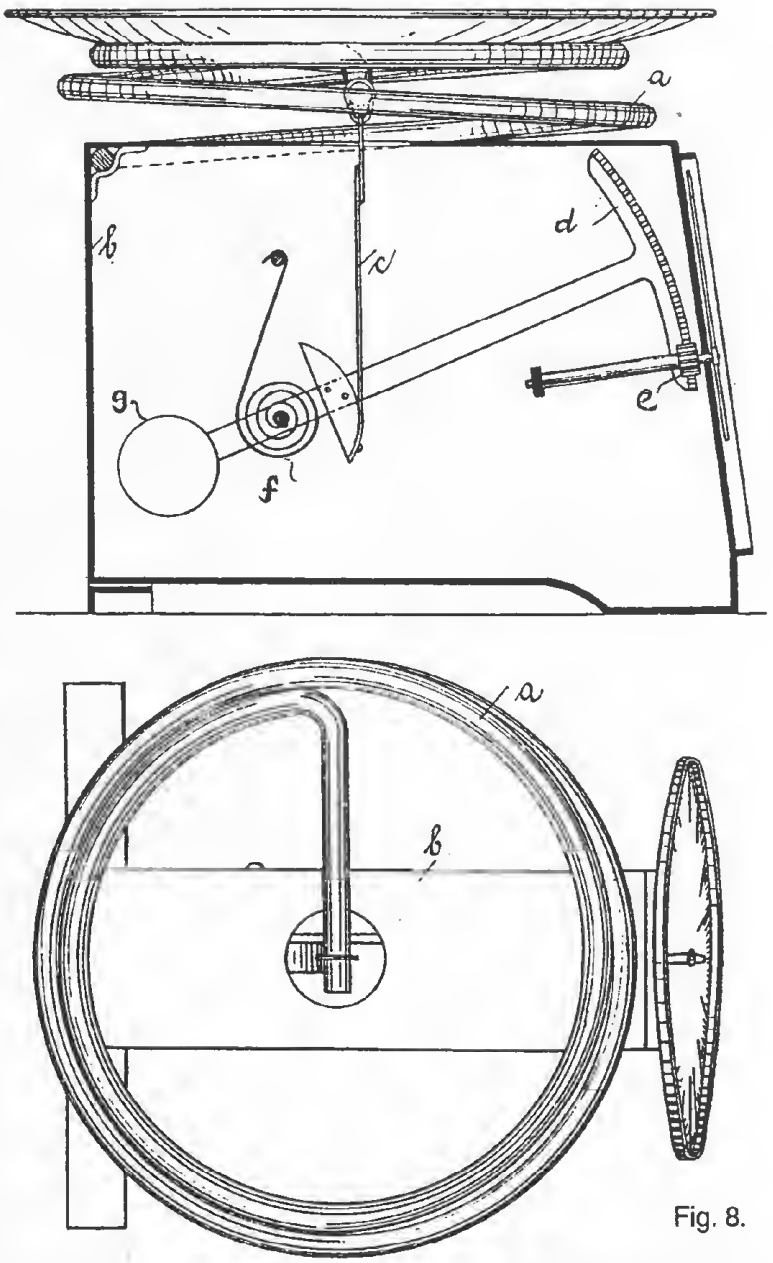


Fig. 8.

In 1904 Automat, Akt–Ges of Berlin took out a patent, number 167192, (Fig. 9.) Maul used the design, almost unaltered, as his 'Columbus' model, except that Maul rejected the first idea of having the bearing (b) going from back to front of the scale, which needed a slot in the rod supporting the letter plate. He changed to having a solid rod (actually a curled tube of brass) with the bearing separated into a rear and a front bearing, like two little nails.

He also rejected the first design for the link (k) at the bottom of the rod (i) which prevented the rod from slipping about. The first design was made of two flat strips which slotted into a slot in the bottom of the rod, but later he changed it to one flat sheet turned through 90°, and bent at each end to provide tabs at (l) and (i) through which pins go.

It is interesting, with any bilateral pendulum, to go through the sequence of events that produces the swinging arms. The letter is put on the pan, which pushes down on the rod (i). The rod (i) pulls down the arms (f) because they are pinned to the rod. The arms (f) twist the bars (g) which

are welded to the back of the decorative arms (d). The twisting action forces the arms (d) to rise into the air, until equilibrium is reached. The arms (d) rotate round the central axis (b), passing each other, and the pointer on the right hand arm passes the graduations marked on the bottom of the left hand arm. Because the pointer and the graduations are on the notional outer circle, there is more space for each graduation, and the small differences in weight can be clearly indicated (0 – 1 oz. on some Columbus scales.) The second pointer is attached to the middle of the right hand arm, and it passes the graduations marked on the middle of the left hand arm, but, because the marks are on a notional circle nearer the central axis (b), those parts of the arms are describing a smaller circle and the graduations have to be put closer together, and usually indicate the higher weights (1 – 4 oz. on the small Columbus).

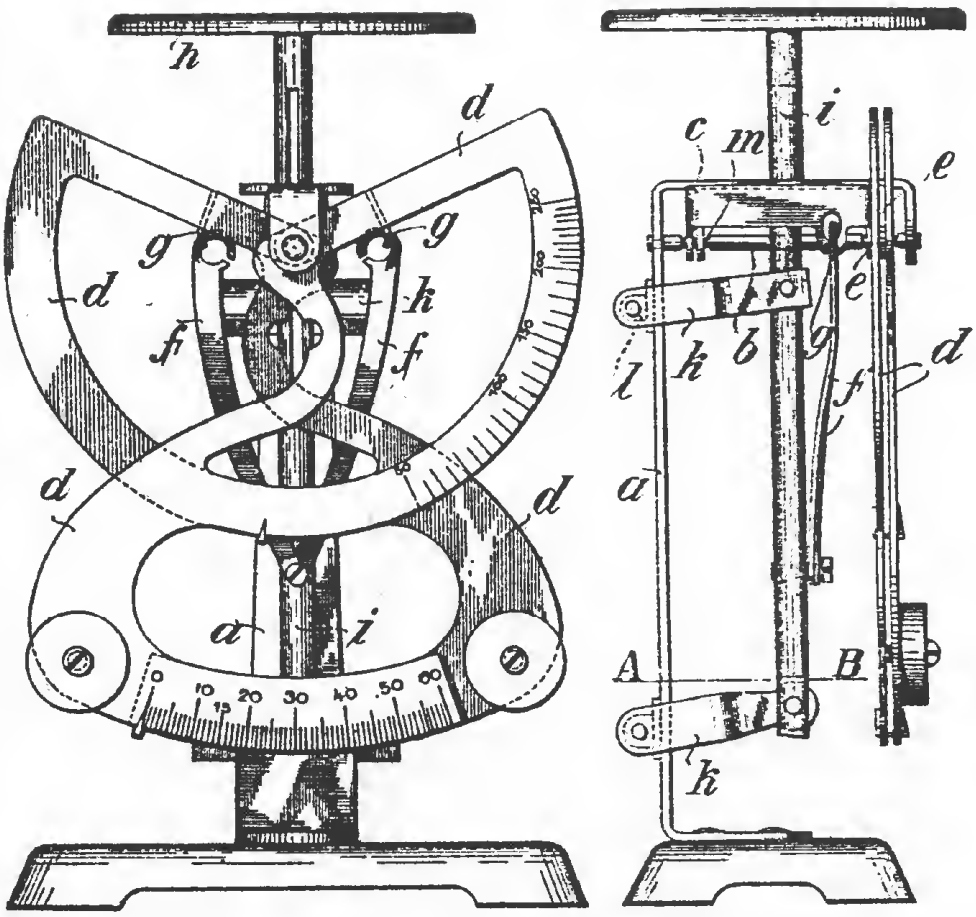
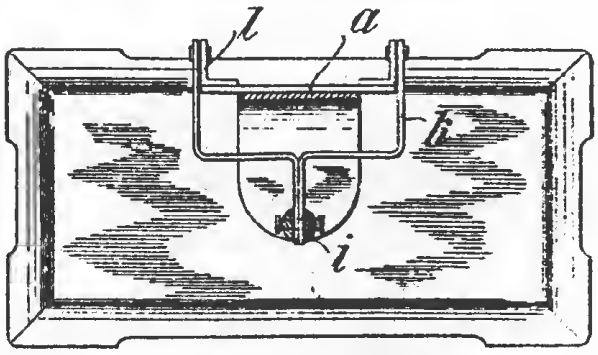


Fig. 9. Patent number 167192.



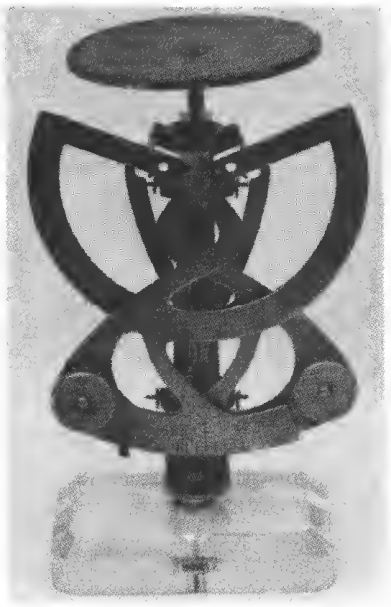
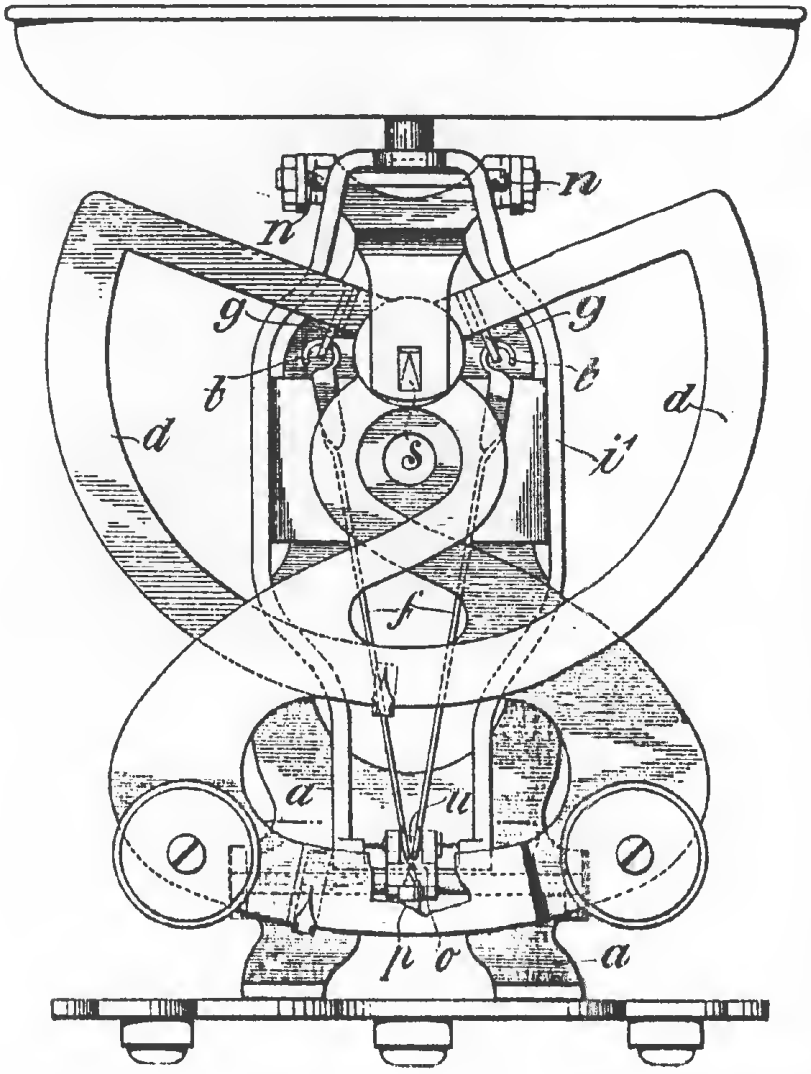


Fig. 10. Glass base.

Not all manufacturers solved the problem of linkage on bilateral pendulums in the same way, and makers, who did not name their scales, can still be differentiated by the fascinating variations in design that they devised. This subject will be discussed fully in a future series of articles on Pendulum Scales.

The same year, 1904, Maul patented a more rugged version of the bilateral pendulum (Fig. 11), patent 184690. He obviously could not place a heavy load on top of the curved tube of brass that formed the rod on the Patent 167192, and so he designed a substantial strap (i) that went up from the bottom link (p), around the linkage system, across the top (where the pan was attached) and down the other side to the bottom link (p). He lengthened the linkages (f), no longer attaching them part way down the rod, but taking them to the bottom link (h) in parallel with the strap (i) when seen from the side. This required a more elaborate bottom link (h) and he took advantage of its greater strength to add a cone pivot (p) for the connection between the link (h) and the strap (i). Perhaps cone pivot is too sophisticated a name for the simple pointed screw he used, but that was its function. Again, this was cheap, easy to make and easy to repair.



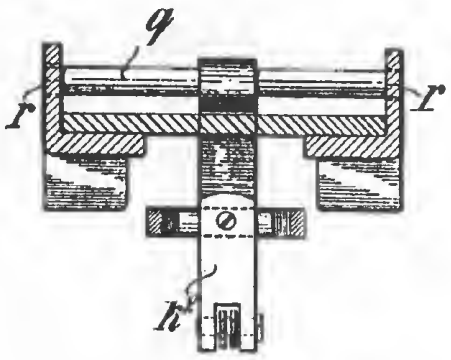
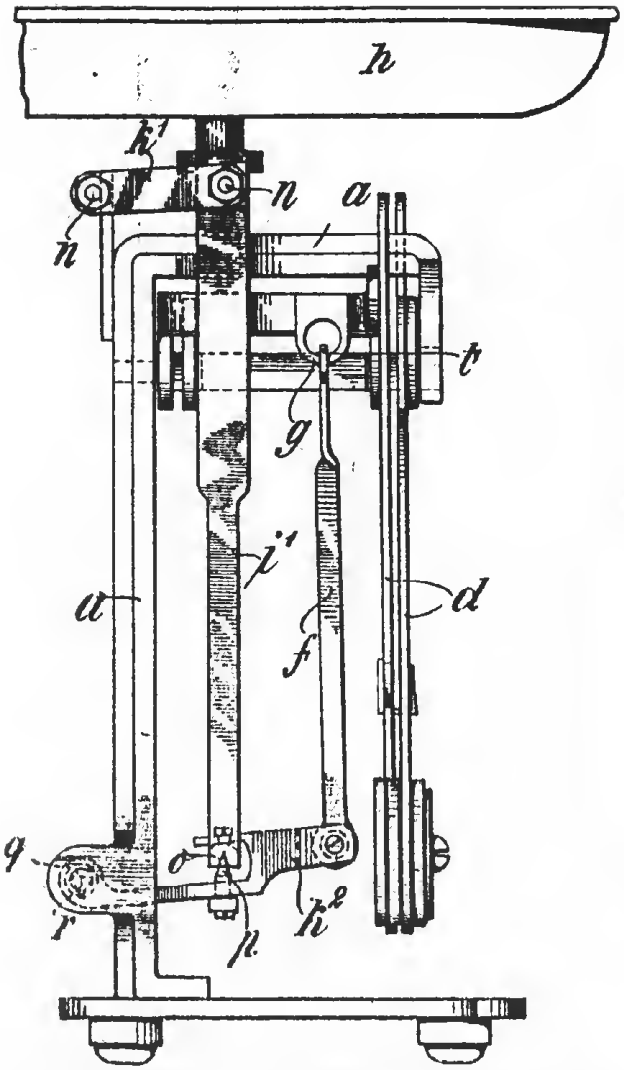


Fig. 11. Patent number 184690.

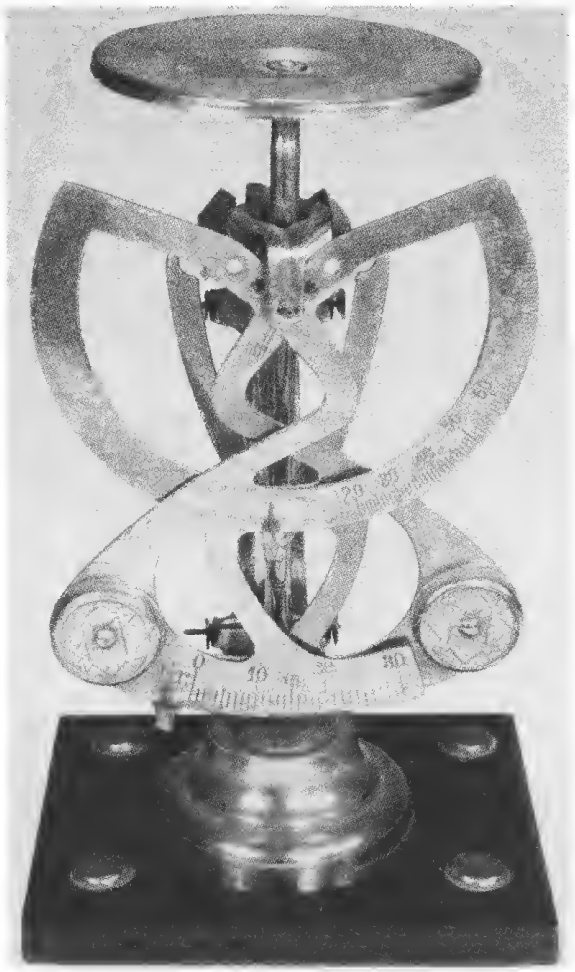
Fig. 12 shows another Columbus scale which has stamped on the front "DRP [Deutches Reichs Patent] 167192 and 184690". Try as I may, I can find no reason for its being protected by the 184690 patent. It conforms to the modified ideas of the 167192 patent, but it bears none of the rugged parts used in the 184690 patent, so I suspect that the reference to the 184690 patent was intended to intimidate rivals who had not studied the patent papers!

Ph J Maul registered his second trade mark "Rictus" in 1908 (Fig. 13) for use on desk equipment and stationery, which was forming an increasing section of his production. The protection of the name "Rictus" was extensive. If the word Rictus was on the label of the goods, it was protected. Even if it was in combination with another word, or in any other colour, size or style, or was in another spelling but sounded like Rictus, it was still restricted to use by Maul. He obviously found this name useful, as he kept the protection until 1938. Please note that for many years the



< Fig. 11 continued.

V Fig. 12. Black glass base.



name was used only on office stationery, and was not used on a scale until 1921 (see next issue of EQM for Part 2 of Ph J Maul.)

He registered yet another trademark (Fig. 14), in 1909, for use on stationery, scales, lever scales (pendulum scales on cast bases), equal-arm scales, letter scales, trade & photographic scales, household & parcel scales. paper scales, writing instruments, ink bottles, pens, pen trays, paper goods, etc. Maul had protection for this mark until 1950.

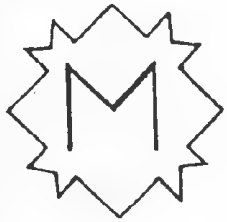
Fig. 13.

Rictus

08. 1188] **Nr. 108979.** M. 12040/32. **Fa. Ph. J. Maul,** Hamburg. Anmeldung vom 14. 6. 1908. Eintragung am 3. 7. 1908.

Geschäftsbetrieb: Vertrieb von Bureau- und Kontor-Geräten.
Waren: Bureau- und Kontor-Geräte.
Der Anmeldung ist eine Beschreibung beigefügt.

Fig. 14.



123847. M. 13724/32. Fa. **Ph. J. Maul,** Hamburg, Böckmannstr. 34. Anmeldung vom 14. 7. 1909. Eintragung am 30. 11. 1909.

Geschäftsbetrieb: Fabrikation und Vertrieb von Kontorartikeln und Wagen jeder Art. Waren: Hebel- und Balken-Wagen, Hebel-Briefwagen, Gewürz- und photographische Wagen, Wirtschafts- und Paket-Wagen, Papierwagen, Schreibzeuge, Tintenlöscher, Federträger, Federleger, Zettelhaken, Notenspießer, Briefbeschwerer, Konzepthalter, Briefklemmer, Kartenständer, Stempelträger, Lineale, Notizkalender, Brieföffner und sämtliche Schreibwaren, Bücherständer, Zettelspießer, Notizblöcke aus Metall, Kopiernäpfe, Autenchtekasten, Netzspulen und Haken für Netzstrickmaschinen.

Ph. J. Maul Part 2 will be in the next issue of EQM.

There are Deadweights at the Bottom of my Garden

By J. KNIGHTS

– THE CONFESSIONS OF AN INDISCRIMINATE COLLECTOR

I live in a small house, having always worked on the principle that it is foolish to be encumbered with a larger place than is strictly necessary for the purposes of keeping dry and warm in the winter.

This being the case, it is perhaps somewhat perverse of me to have embarked upon the collecting of weights and scales as a hobby.

Given my lack of space, it would perhaps have made more sense to collect stamps, coins, porcelain miniatures or car numbers instead of the more capricious items of metrobelia that currently clutter up my domicile.

The very desire to hoard is one of life's great mysteries, as it appears to be an instinct that we share largely with certain members of the order "rodentia", with the one proviso that the gerbil can at least eat his collection when times are hard. Anyone who has ever tried to nibble a Beranger will know that no such practical application attends our own brand of acquisitiveness, which must therefore be dismissed as an activity which offers no prospect of advantage in the struggle to keep the grim reaper from finally closing us down as another failed experiment.

My proclivities in collecting are actually even more bizarre than has hitherto been declared, as I do keep rolling home with things that are (despite all resolution to stick to grain weights, pocket beams and guinea balances) undeniably large.

It began with things that were merely long, when various steelyards, bismars and length measures unaccountably used to appear in my living room. These could at least be hung on the wall or leant in a corner, and thus be made to occupy a minimum of space.

From "long" I soon moved to "fat", as the likes of the quarter cran and the wooden bushel put in an appearance. These were placed on top of display cases, so as to be as out of the way as anything can be which occupies over 2,000 cubic inches of room space.

I don't know what inspired me to start on the big scales. The first one was a decidedly tatty wooden cased bob-up which was acquired against all the rules of collecting, and saved from its terminal decline by far too many hours of restoration. This now stands in the corner with a bottle garden on it.

The next one was described simply as a sack-scale by the seller, who probably thought that Quintenz was a heavy metal pop group. To find a decimal scale from Holland in the Dukeries was something of a revelation to me, given that the Dutch seem to spend most of their time carting lorry loads of British collectibles over to the Low Countries so I , again, was prevailed upon to purchase this wholly unsuitable and inconvenient item. After a sojourn in my shed, this

was also given a clean up and a coat of paint and elevated to a place in the middle of my living room. Here it serves as a rudimentary coffee table and a peril to any pair of tights that enters the house.

By this time the living room was incapable of further embellishment, so when the deadweight arrived (a nice wooden-framed high pattern machine with designer woodworm) it very nearly ended up at the bottom of my garden. In the event it now lives in my bedroom where it vainly tries to look inconspicuous.

I fear that I may have the instincts of a collector but lack the iron discipline that is necessary to confine enthusiasm and concentrate one's activities in sensible, well defined areas.

The result is that whereas others of our calling count their candlesticks or revel in that newly acquired rocker by Harrison, I am engulfed in a sea of ungainly miscellanea.

There must be homes for people like me!

Incidentally, if anyone knows of one of those nice old cast-iron accelerating platform machines with the swan-neck steelyard, relieving gear, a full set of loose poises and all its original paint-work – do me a favour and don't tell me about it.

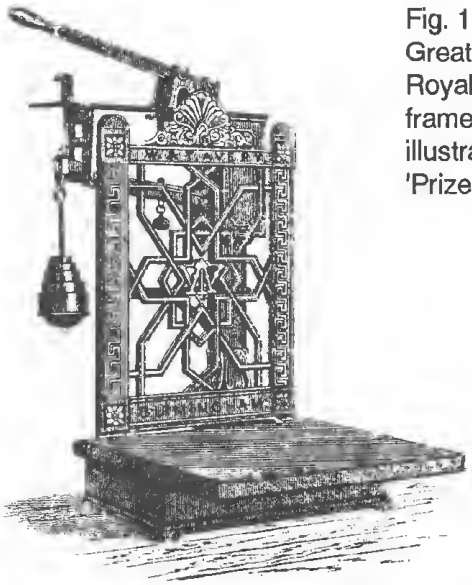


Fig. 2. Contracting Imperial or Inverted Machine. Japanned and gilt Pillar. Shown in the W & T Avery catalogue of 1880.

Fig. 1. The top relieving handle had a plate stating 'Prize Medal, Class 5, Great Exhibition.' The top of the frame had cast into it 'By Her Majesty's Royal Letters Patent. W Chambers Day Patentee.' but the middle of the frame had cast into it 'Day & Millward, Makers, Birmingham'. It was illustrated in the 1889 Day & Millward catalogue, with a cartouche saying 'Prize Medals 1851, 1862 and 1867.'